The nature and significance of the Faroe-Shetland Terrane: linking Archaean basement blocks across the North Atlantic

Holdsworth, R.E.[1], Morton, A.[2], Frei, D.[3], Gerdes, A.[4], Strachan, R.A.[5], Dempsey, E.[6], Warren, C.[7] & Whitham, A.[8]

1 = Department of Earth Sciences, Durham University, Durham, DH1 3LE, UK
2 = HM Research, Giddanmu, St Ishmaels SA62 3TJ, UK and CASP, University of Cambridge, Madingley Rise, Cambridge CB3 0UD, UK.
3 = Department of Earth Sciences, University of the Western Cape, 7530 Bellville, Western Cape, South Africa.
4 = Goethe-Universität Frankfurt, Institut für Geowissenschaften, Petrologie und Geochemie, Altenhöferallee 1, 60438 Frankfurt am Main, Germany.
5 = School of Earth and Environmental Sciences, University of Portsmouth, Portsmouth, PO1 3QL, UK.
6 = School of Environmental Sciences, University of Hull, Hull, HU6 7RX, UK
7 = School of Environment, Earth and Ecosystem Sciences, The Open University, Walton Hall, Kents Hill, Milton Keynes MK7 6AA, UK.
8 = CASP, University of Cambridge, Madingley Rise, Cambridge CB3 0UD, UK.

Abstract: Core samples of the continental basement rocks that underlie the eastern Faroe-Shetland Basin (FSB) and its inshore margins west of Shetland reveal a suite of predominantly granodioritic to granitic orthogneisses (including TTG), together with lesser volumes of foliated granitoids and subordinate dioritic to mafic gneisses and amphibolites. A small area of lithologically similar gneisses also crops out onshore at North Roe/Uyea west of the Caledonian front in Shetland. In the core samples, coarse grained gneissose textures and mineralogies consistent with upper amphibolite facies metamorphism are overprinted by a weak, but ubiquitous, static greenschist facies retrogression. Later structures include widespread epidote-quartz veining, and local developments of mylonite, cataclasite, pseudotachylite and phyllonite. Regions associated with the Rona Ridge oil fields (e.g. Clair, Lancaster) also preserve extensive brittle fracturing and associated low temperature hydrothermal mineralization (quartz, adularia, calcite, pyrite/chalcopyrite) with significant fracture-hosted hydrocarbons. New and published U-Pb zircon analyses from the gneisses offshore give a relatively narrow range of Neoarchaean protolith ages (ca 2.7-2.8 Ga) spread over a geographic area of 60,000 km^2 west of Shetland. Detrital zircon data from overlying Triassic-Cretaceous sedimentary sequences in the FSB suggest an equivalent limited range of Neoarchaean source materials. Hf isotopic data indicate involvement of Palaeo- to Mesoarchaean crustal sources. Overall, our findings suggest that a major phase of Neoarchaean crustal formation and associated high grade metamorphism dominates basement rocks in the region. They are similar in age and lithology to the protoliths of the nearest onshore Lewisian Complex of NW Scotland (Rhiconich Terrane). However, they lack geochronological or textural evidence for the widespread Proterozoic Laxfordian events (ca 1.7-1.8 Ga) which are widespread in Scotland. This suggests that the Precambrian rocks west of Shetland – the Faroe-Shetland Terrane - can be correlated with the Archaean rocks of the

Central Greenland-Rae Craton and that a northern limit of Proterozoic reworking lies just offshore from the north coast of Scotland.

Keywords: Lewisian; Faroe-Shetland; Neoarchaean; Nagssugtoqidian; Laxfordian; U-Pb geochronology.

Introduction

The nature, age and affinities of the onshore continental basement terranes in the circum-North Atlantic region are now fairly well understood (e.g. Park 2005, Wheeler et al. 2010; Mason 2015 and references therein). In contrast, our knowledge of the basement in many of the intervening offshore areas is relatively sparse since relatively few wells have penetrated through the overlying Palaeozoic to Recent sedimentary cover sequences. Even in wells where core materials exist, these have commonly not been studied in any great detail. An improved understanding of the age and affinities of basement in offshore regions will allow better constraints on the likely locations of major tectonic and terrane boundaries across the North Atlantic. It also better constrains which onshore areas are best used as surface analogues along the continental margins to investigate the potential influences of basement inheritance on the structural development of the Atlantic margins.

In this paper, we present new lithological descriptions and the results of U-Pb and Lu-Hf zircon geochronological studies from a range of basement rocks sampled in offshore borehole cores taken in the region west of Shetland and north of Scotland and the Outer Hebrides. These data supplement a small amount of information provided by Ritchie et al. (2011), which was largely based on a more detailed unpublished report by Chambers et al. (2005).

Location and Regional Setting

Geophysical evidence and geological sampling from the seabed and borehole cores suggests that continental basement rocks underlie a large region north of Scotland and west of Shetland. Precambrian basement rocks are exposed onshore in Shetland and on small islands north of Scotland and west of Orkney (notably Foula, Sule Skerry, Stack Skerry, Rona, Sula Sgeir; Fig. 1; Ritchie et al. 2011). West of the Walls Boundary Fault, most of these rocks are assigned to the Lewisian Gneiss Complex (Fig. 1), although some in Shetland are thought to be of younger Moine or Dalradian (i.e. Neoproterozoic) affinities (Flinn 1985). Offshore, the affinities of the basement are less certain, although the rocks are generally viewed as being correlatives of the Lewisian. Two prominent elongate basement ridges known as the Rona Ridge and Solan Bank High are buried beneath mainly Mesozoic and younger sedimentary rocks and define the southeastern margin of the Faroe-Shetland Basin. They trend NE-SW running from north of Shetland to the NW tip of Scotland and lie in the uplifted footwalls of Mesozoic normal faults. A basement ridge of this trend continues to the south forming the Outer Hebrides island chain (Fig. 1).

In Scotland, the Archaean-Palaeoproterozoic Lewisian Gneiss Complex forms the basement of the foreland of the Ordovician-Silurian Caledonide orogen (Fig. 1). The western limit of the orogen is defined by the easterly-dipping Moine Thrust (Fig. 1), although Neoarchaean basement inliers within the Caledonian hinterland have been broadly correlated with the Lewisian (Friend et al. 2008). The gneiss complex represents a fragment of Laurentian crust that was juxtaposed with the European plate during the Early Palaeozoic Caledonian orogenic cycle, and subsequently separated from North America during the late Mesozoic to early Cenozoic opening of the North Atlantic Ocean. It is dominated by orthogneisses, the protoliths of which were emplaced between ca. 3.1 Ga and ca. 2.7 Ga. They were then subject to high-grade metamorphism at 2.7 and 2.5 Ga, dyke intrusion at ca. 2.4 and 2.0 Ga, and variably intense Palaeoproterozoic reworking at ca. 1.8-1.7 Ga (e.g. Whitehouse 1993; Kinny and Friend 1997; Friend and Kinny 2001; Whitehouse and Bridgewater 2001; Kinny et al. 2005; Park 2005; Wheeler et al. 2010; Mason 2012, 2016; Goodenough et al. 2013; Davies and Heaman 2014; Crowley et al. 2015). This geological history has strong similarities to the Nagssugtoqidian belt of SE Greenland, and the two segments of crust are thought to have been contiguous prior to opening of the North Atlantic (Kalsbeek et al. 1993; Friend and Kinny 2001; Park 2005).

The Shetland Islands form the northernmost exposures of the Caledonide orogen in the British Isles (Fig. 1). A large part of Shetland is underlain by Neoproterozoic to Cambrian metasedimentary successions that were deformed and metamorphosed during the Caledonian orogeny (Flinn 1985; 1988). In northwest Shetland, the easterly-dipping Uyea Shear Zone in the North Roe-Uyea area is probably structurally analogous to the Moine Thrust (Fig. 1; Walker et al. 2016). A suite of granitic orthogneisses and metagabbros in its footwall have been correlated directly with the Lewisian Gneiss Complex (Pringle 1970; Flinn et al. 1979; Flinn 1985, 2009).

Isolated U-Pb zircon data obtained from basement gneisses from offshore boreholes north and west of Shetland give ages in the range 2.7-2.8 Ga and lack any evidence for Palaeoproterozoic (Laxfordian) reworking (Chambers et al. 2005). This led Ritchie et al. (2011) to tentatively suggest that the Lewisian-like basement rocks lying to the west of the Walls Boundary fault could be assigned to a single Neoarchaean domain they termed the 'Faroe-Shetland Block'. This block, they suggested, is located northward of the eastwards continuation of the Nagssugtoqidian belt through mainland Scotland.

The present study has looked in detail at over 70 thin sections of basement gneisses from the offshore region west of Shetland. Some are existing sections held by the BGS or the Clair Joint Venture Group, but many are new. The locations of all offshore borehole cores that contain basement referred to in the present paper are shown in Figure 1.

Lithologies and Contact Relationships

Basement rocks

The most detailed description of basement lithologies to date is given in Chambers et al. (2005), summarised in Ritchie et al. (2011). It covered material studied from 42 offshore boreholes from a wide region extending from west of Shetland southwards to the Stanton High (west of Mull) and offshore to Rockall. In addition to thin section descriptions of lithologies, these authors also carried out major and trace element geochemistry on all samples.

The basement rocks west of Shetland are dominated by quartzofeldspathic granodioritic orthogneisses, with subordinate units of more granitic, intermediate and mafic compositions. Most of these gneisses are thought to be of tonalitic-trondhjemitic-dioritic affinity, although this has been proven using strict geochemical criteria in only a small number of samples (Chambers et al. 2005). The rocks are mostly foliated and show evidence for amphibolite facies regional metamorphism variably overprinted by a weak, but persistent low-grade retrogression. Later fault rocks, including mylonites and pseudotachylytes, are locally preserved but are very minor constituents.

The most complete set of basement cores come from the sub-horizontal 206/7a-2 well drilled by Elf through the Clair basement ridge in a SE to NW direction (Fig. 2a). These basement rocks are described in more detail below as it is possible to see some of the contact relationships of the various constituent gneisses in the six more or less continuous ca 9-10 m core sections (Fig. 2b). Furthermore, they exhibit a range of lithologies that are highly representative of the region west of Shetland (e.g. Chambers et al. 2005; Ritchie et al. 2011). Where necessary, reference will be made to other cores in cases where other features have been observed that are not seen in 206/7a-2 – logs of these additional cores are shown in Figure 3. Core from 206/8-8 has been varnished, so some of the best images of lithology are taken from that core, together with 206/7a-2 in Figure 4.

Medium to coarse grained, grey granodioritic gneiss (Fig. 4a) forms ca 55% of the 60 m of core from 206/7a-2. Subordinate interlayered units include medium to coarse grained pink granitic gneiss (15%, Fig. 4b) and foliated coarse grained porphyritic granite (15%, Fig. 4c – see also 206/9-2, Fig. 3). The latter rock type occurs as sheets apparently subparallel to the gneissic layering in most cases, although a single discordant example in 206/7a-2 is associated with a local cm-scale high strain shear zone (Fig. 4d). Units of green mafic gneiss (10%) and grey dioritic gneiss (5%) are also present locally and are commonly either interlayered with the other gneisses, or occur as earlier foliated enclaves (Fig. 4e, see also 206/8-8, Fig. 3). About 20% of the gneisses comprise mm- to cm-scale interlayered units of the various lithologies described above (Fig. 2b). In a few sections of core, metre-scale folding of the gneissic layering is preserved (Fig. 4f).

In thin section, the gneisses are typically medium to coarse grained, with cuspate-lobate grain boundary textures between quartz, feldspar and variably retrogressed mafic minerals (amphiboles, pyroxenes) consistent with high temperature regional metamorphism (Fig. 5a, b; e.g. Passchier and Trouw 2005). Marginal myrmekites and perthitic textures are widely preserved in rocks with more granitic compositions and are again consistent with moderate to low intensity high temperature deformation (Simpson 1985). Lower temperature subgrain rotation recrystallization textures are only very weakly developed, as are local deformation lamellae and undulose extinction in quartz grains. Originally calcic plagioclase grains are ubiquitous, but now commonly have more albitic compositions and are either altered to sericite or seeded with numerous tiny grains of epidote/clinozoisite (Fig. 5c). Likewise, pyroxenes are usually only preserved as local relict grains and are partially to completely pseudomorphed by fine grained intergrown aggregates of chlorite ± green biotite ± colourless amphibole ± epidote ± equigranular quartz ± calcite, titanite and ore; chlorite and epidote often occur as distinctive overgrowing coronae (Fig. 5d).

Overall, the rocks preserve textural and mineralogical evidence for early amphibolite facies regional metamorphism, which has then been variably overprinted by low temperature greenschist facies retrogression and (mostly) very low intensity associated strains. Overall finite strains are low and there is no compelling evidence pointing to more than one phase of prograde amphibolite facies deformation and metamorphism. Chambers et al. (2005) suggested that the preservation of rare examples of coarse-grained, two-pyroxene assemblages indicated that metamorphism locally reached granulite facies. Fine to ultrafine grained epidote-quartz veins are locally common cross-cutting the gneisses (Fig. 5e), as are small (mm-to-cm thick) rare cross-cutting units of phyllonite (also seen in 206/12-1, Fig. 3), cataclasite and pseudotachylyte (e.g. 206/9-2, Fig. 3).

Cover sequences

The Rona Ridge and Solan Bank High basement ridges are overlain by diverse, but volumetrically limited Late Palaeozoic-Mesozoic cover sequences. The impersistence of these mainly fluviatile-lacustrine to shallow marine deposits seems to reflect the long-term persistence of the ridges, with many local unconformities developed (Ritchie et al. 2011; Stoker et al. 2018). Basement - cover unconformities are sampled directly in several cores (Fig. 3), e.g. 205/21-1A (Lancaster, basement overlain by Jurassic Rona Sandstone), 206/8-8 (Clair, basement overlain by Devonian Clair Group) and 206/12-1 (southern Clair Ridge, basement overlain by possible upper Cretaceous breccia conglomerate – see below). In all cases, there is very little evidence of deep weathering profiles developed in the basement rocks underlying these unconformities. Clasts of all basement host and early fault rock types – bar pseudotachylyte – are found within the oldest overlying cover sequence in 206/8-8 (Fig. 5f, Devonian Clair Group). Later fractures and veins – which occur in both basement and Devonian to Jurassic cover sequences - are associated with widespread sediment-filled fractures, quartz-adularia-calcite-base metal sulphide mineralization and hydrocarbons (bitumen, oil). These features will be described in separate publications.

Sample Locations and Descriptions

The core materials examined here are conveniently subdivided into four geographic groups, here termed (from northeast to southwest): '*Victory*', '*Greater Clair*', '*Lancaster*' and '*Sula Sgeir-Orkney*' (Table I; Fig. 1). From these sub-areas, 14 samples have been dated using U-Pb zircon geochronology, complementing the three dates previously obtained from the study area by Chambers et al. (2005). In addition, Lu-Hf isotopic analyses were undertaken on 9 of the 14 zircon samples.

Sula Sgeir-Orkney sub-area

Sample HM11705 comes from 13.00 m depth in BGS borehole 88/02. The succession encountered in this borehole was described by Chambers et al. (2005) as comprising quartzo-feldspathic schist cut by cataclasite bands. The analysed sample is a strongly deformed medium grained granitic rock comprising quartz, K-feldspar, plagioclase, biotite and hornblende with minor titanite, epidote, allanite, ore, clinozoisite, zircon and secondary chlorite (after biotite and hornblende). The foliation is defined by a strong shape-preferred elongation of quartz, feldspar and mafic minerals. It is cut by several foliation-parallel cataclasite bands and associated pseudotachylytes (Fig. 6a).

Samples HM11709 and HM11711 come from BGS seabed cores (59-04/85DM and 59-04/186DM, respectively). HM11709 is a granitic gneiss containing sericitised plagioclase, quartz, K-feldspar, chlorite, biotite and muscovite, together with relict garnet, which is now mostly altered to chlorite, biotite and plagioclase. HM11711 is a highly altered granite, consisting of quartz, sericitised plagioclase, epidote, calcite and clay minerals.

Lancaster sub-area

Sample HM11686 comes from exploration well 204/25-1 (depth 2870.43 m) and is a coarse grained interbanded unit of granodioritic-dioritic gneiss (Fig. 6b). It comprises varying proportions of plagioclase, quartz, green pyroxene and hornblende, ore minerals, secondary chlorite, and accessories (allanite, apatite, zircon). It is cut by small fractures with associated calcite veining.

Sample HM11687, from exploration well 204/26-1A (depth 2648.68 m), is a medium to coarse grained granodioritic gneiss. It comprises sericitized plagioclase, quartz and altered mafics (after amphibole or pyroxene), which are now mainly fine-grained chlorite, epidote and ore minerals. Apatite and zircon are accessory phases.

Sample HM11688 comes from exploration well 204/27-1 (depth 2136.20 m) and is a medium to coarse grained granitic gneiss comprising plagioclase, K-feldspar, quartz, biotite and titanite, with accessory ore, allanite and secondary chlorite. Other than fracturing, there is little evidence for low temperature overprinting in quartz grains.

Sample HM11689 comes from exploration well 204/28-1 (depth 1941.55 m) and is a granodioritic gneiss comprising sericitized plagioclase, quartz, K-feldspar, biotite and sparse grains of green amphibole, both of which are altered to secondary chlorite. Accessories include ore, allanite and zircon. Quartz grains show minor development of undulose extinction but otherwise preserve high temperature coarse grain sizes and cuspate-lobate boundaries with feldspars.

Greater Clair sub-area

Sample HM11691 comes from exploration well 205/20-1 (depth 2017.50 m) and is a coarse grained granitic gneiss. It comprises plagioclase, K-feldspar, quartz, brown-green hornblende, altered pyroxene, and accessories (ore, allanite, zircon, epidote, titanite, apatite). The rock is weakly foliated with well-developed marginal myrmekite development (Fig. 6c). Some minor subgrain development and fine subgrain rotation recrystallization is preserved in quartz with numerous microcracks filled with epidote.

Samples HM11692 and **HM11694** are both taken from exploration well 206/7a-2, at depths 2141.40 m and 2593.30 m respectively. They are medium to coarse grained granodioritic gneisses comprising plagioclase, quartz, K-feldspar and mafics (amphibole, biotite, chlorite – possibly after pyroxene), together with minor amounts of epidote, allanite, apatite, zircon, ore and titanite. Whilst dominated by coarse grained high temperature fabrics, mm-wide zones of low temperature brittle-ductile overprinting are evident and are associated with increased retrogression and breakdown of plagioclase to fine grained aligned aggregates of white mica and epidote (Fig. 6d). Associated quartz grains show evidence of limited marginal subgrain rotation recrystallization in these regions and feldspar clasts have fibrous quartz-white mica tails consistent with the operation of solution-precipitation creep (Fig. 6d).

Sample HM22702 is a coarse grained granodioritic gneiss from exploration well 206/12-1 (depth 1716.65 m). It comprises highly sericitised plagioclase, quartz and fine-grained aggregates of brown biotite together with accessory apatite, ore, epidote and zircon.

Victory Sub-area

Sample HM11698 comes from exploration well 208/23-1 (depth 2071.26 m) and is a granitic gneiss comprising plagioclase, K-feldspar, quartz and minor amounts of ore, epidote, titanite, limonite and zircon. It preserves evidence of moderate deformation at high temperatures with elongate quartz grains domains only locally overprinted by weak subgrain development and bulging recrystallization. Plagioclase is heavily saussuritized and is substantially replaced by fine calcite-quartz intergrowths.

Sample HM11699, from exploration well 208/26-1 (depth 3741.31 m), is a medium to coarse grained granodioritic gneiss containing plagioclase, quartz, brown biotite, brown-green hornblende, relict clinopyroxene (2%) and accessories (ore, epidote). Fine aggregates of green amphibole, biotite and epidote occur locally, possibly after orthopyroxene (Fig. 6e). Both hornblende and biotite are locally altered to fine aggregates of secondary chlorite. Cuspate-lobate quartz-feldspar grain boundaries are well developed with very little low temperature recrystallization of quartz.

Sample HM11700 comes from exploration well 208/27-2 (depth 1357.11 m) and is a mixture of coarse grained granitic and more mafic granitic gneiss. The mafic unit comprises plagioclase, K feldspar, quartz, brown partially altered pyroxene and accessories (ore, epidote, apatite, zircon) (Fig.

6f). The pyroxene is altered locally to blue-green amphibole and has prominent ore-rich alteration rims. The more leucocratic unit comprises plagioclase, K-feldspar and quartz with minor biotite and epidote.

U-Pb and Lu-Hf Zircon Geochronology

Analytical methods

The samples chosen for analysis (Table I) were collected from a larger sample set, some of which did not yield minerals suitable for U-Pb dating. Following thin-section preparation, the samples were crushed to < 250 μm at the Open University, Milton Keynes, UK. Zircons were concentrated using a combination of magnetic separation and heavy liquid treatment. The final separation step was made by hand-picking zircon grains from the heavy and non-magnetic fraction using an optical microscope. The individual zircon grains were mounted on double-sided, transparent adhesive tape and subsequently embedded in 1-inch diameter circular epoxy mounts for polishing.

All U-Pb age data were obtained at the Central Analytical Facility (CAF), Stellenbosch University, South Africa, by laser ablation - single collector - magnetic sectorfield - inductively coupled plasma - mass spectrometry (LA-SF-ICP-MS) employing a Thermo Finnigan Element2 mass spectrometer coupled to a NewWave UP213 laser ablation system. All age data presented here were obtained by single spot analyses with a spot diameter of 30 μm and a crater depth of approximately 15-20 μm, corresponding to an ablated zircon mass of approximately 150-200 ng. The methods employed for analysis and data processing are described in detail by Gerdes and Zeh (2006) and Frei and Gerdes (2009). For quality control, the Plešovice (Sláma et al. 2008) and M127 (Nasdala et al. 2008; Mattinson 2010) zircon reference materials were analyzed, and the results were consistently in good agreement with the published ID-TIMS ages. Full analytical details and the results for all quality control materials analysed are given in Table II. The calculation of concordia ages and plotting of concordia diagrams were performed using Isoplot/Ex 3.0 (Ludwig 2003). CL (cathodoluminescence) imaging of the zircon grains was undertaken at the CAF using a Zeiss Merlin SEM, with a beam current of 10 nA and a 15 mm working distance. Analyses used for age calculations were screened for inheritance based on textures as revealed by CL images and ^{207}Pb-^{206}Pb age determinations, and are based on analyses that are 99-101% concordant. For calculations of upper intercept ages, anchoring of regression lines was not employed.

Also included in the U-Pb zircon geochronology study are four sandstone samples ranging in age from Triassic to Cretaceous. The analytical protocol followed for the detrital zircon study is identical to that for the basement samples described above, except that the grain size fraction was that used routinely for conventional heavy mineral provenance investigations (63-125 μm).

Hafnium isotope measurements were performed with a Thermo-Finnigan NEPTUNE multi collector ICP-MS at Goethe University Frankfurt (GUF) coupled to RESOlution M50 193nm ArF Excimer (Resonetics) laser system following the method described in Gerdes and Zeh (2006, 2009). Between 10 and 19 individual zircons per sample were analysed. Prior to Hf-isotope analysis, the internal textures were investigated by cathodoluminesence imaging. Only homogeneous growth zones in zircons yielding concordant or nearly concordant U-Pb ages were targeted for Hf-isotope analysis. Spots of 40 µm in diameter were drilled with a repetition rate of 5.5 Hz and an energy density of 6 J/cm^2 during 50s of data acquisition. The instrumental mass bias for Hf isotopes was corrected using an exponential law and a $^{179}Hf/^{177}Hf$ value of 0.7325. In case of Yb isotopes, the mass bias was corrected using the Hf mass bias of the individual integration step multiplied by a daily βHf/βYb offset factor (Gerdes and Zeh 2009). All data were adjusted relative to the JMC475 of $^{176}Hf/^{177}Hf$ ratio = 0.282160 and quoted uncertainties are quadratic additions of the within run precision of each analysis and the reproducibility of the JMC475 (2SD = 0.0028%, n = 8). Accuracy and external reproducibility of the method was verified by repeated analyses of reference zircon GJ-1 and Plesovice, which yielded a $^{176}Hf/^{177}Hf$ of 0.282010 ± 0.000025 (2 SD, n=7) and 0.0282475 ± 0.000020 (n=7), respectively. This is in excellent agreement with previously published results (e.g. Gerdes and Zeh 2006; Slama et al. 2008) and with the LA-MC-ICPMS long-term average of GJ-1 (0.282010 ± 0.000025; n > 800) and Plesovice (0.282483 ± 0.000025, n > 300) reference zircon at GUF.

The initial $^{176}Hf/^{177}Hf$ values are expressed as εHf(t), which is calculated using:

(i) a decay constant value of 1.867×10^{-11} $year^{-1}$
(ii) CHUR after Bouvier et al. (2008; $^{176}Hf/^{177}Hf$CHUR, today = 0.282785 and $^{176}Lu/^{177}Hf$ CHUR,today = 0.0336), and
(iii) the apparent Pb-Pb ages obtained for the respective domains.

For the calculation of Hf two stage model ages (T_{DM}) in billions of years, the measured $^{176}Lu/^{177}Hf$ of each spot (first stage = age of zircon), a value of 0.0113 for the average continental crust, and a depleted mantle $^{176}Lu/^{177}Lu$ DM = 0.0384 and $^{176}Hf/^{177}Hf$ DM = 0.283165 (average MORB; Chauvel et al. 2008) were used.

Results: U-Pb ages from basement rocks

The 14 samples of crystalline basement rocks dated here yield a comparatively limited range of zircon U-Pb ages within the Neoarchaean (Table III). These data lie in the same age range as the 3 dates obtained by Chambers et al. (2005) in the same study area, which are also listed in Table III.

Sula Sgeir-Orkney sub-area

Sample HM11705 (BGS borehole 88/02, 13.00 m) contains elongate prismatic zircons with typical oscillatory igneous zonation patterns (Figs 7a and b). Occasional zircons are strongly metamict, but nevertheless retain remnant oscillatory zoning (Fig. 7b). They display a discordant trend with an upper intercept age of 2754 ± 22 Ma with an MSWD of 0.88 (Fig. 8a).

Sample HM11709 (BGS seabed core 59-04/85DM) has equant to elongate prismatic zircons with indistinct oscillatory magmatic zoning. They are mostly dark under CL (high-U) with a small number of grains having bright rims. The main zircon group yields a concordia age of 2747 ± 7 Ma with an MSWD of 0.42 and a probability of concordance of 0.99 (Figs 8b and c). In addition, there is a small number of older zircons interpreted as inherited, together with two zircons with younger ages (2621 ± 26 Ma and 2628 ± 28 Ma) probably related to Pb-loss during a subsequent Neoarchaean thermal (possibly hydrothermal) event.

Sample HM11711 (BGS seabed core 59-04/186DM) has a zircon population with a concordia age of 2826 ± 5 Ma, with an MSWD of 0.45 and a probability of concordance of 1.00 (Figs 8d and e), excluding a single younger zircon dated as 2681 ± 39 Ma.

Lancaster sub-area

Sample HM11686 (204/25-1, 2870.43 m) contains equant to stubby subhedral to subrounded zircons that show evidence of resorbtion. Grains show indistinct oscillatorily-zoned centres that are dark under CL, with bright rims that also have magmatic textures (Fig. 7c). Many of the zircons in this sample are moderately to highly fractured. On the Wetherill concordia diagram, they show a discordant trend with an upper intercept age of 2729 ± 12 Ma with an MSWD of 0.52 (Figs 9a and 9b). In addition, there is an older less precise analysis at ca 2850 Ma, interpreted as inherited, and a small number of slightly younger zircons.

Sample HM11687 (204/26-1A, 2648.68 m) contains zircons with indistinct oscillatory magmatic zoning, with euhedral to subhedral relatively equant morphologies. They fall on a discordant trend (Figs 9c and 9d) with an upper intercept age of 2733 ± 14 Ma (MSWD = 2.0), but there is one older grain dated as ca. 3100 Ma, interpreted as inherited. The four zircons with 100% concordance yield a concordia age of 2744 ± 16 Ma with an MSWD of 0.41 and probability of concordance of 0.84 (Fig. 9e).

Sample HM11688 (204/27-1, 2136.20 m) has prismatic zircons that range from stubby to moderately elongate, and are euhedral to subrounded. Some display indistinct oscillatory magmatic zoning (Fig. 7d) but many show metamictisation/recrystallisation owing to relatively high U contents, which has partially or wholly destroyed the original igneous zoning fabric. They display a discordant trend (Figs 9f and g) with an upper intercept age of 2745 ± 15 Ma (MSWD = 4.2). The concordant zircons yield a concordia age of 2739 ± 8 Ma with an MSWD of 0.87 and probability of concordance of 0.62 (Fig. 9h). As with sample HM11687, there is also evidence for a minor inherited component.

Sample HM11689 (204/28-1, 1941.55 m) has zircons that display a discordant trend (Fig. 9i) with an upper intercept age of 2762 ± 13 Ma (MSWD = 8.6). The concordant zircons yield a concordia age of 2793 ± 10 Ma with an MSWD of 1.0 and probability of concordance of 0.45 (Fig. 9j).

<u>Greater Clair sub-area</u>

Sample HM11691 (205/20-1, 2017.50 m) has equant to prismatic, euhedral, subhedral and subrounded zircons with typical igneous dark oscillatory zoning, many of which are surrounded by brighter oscillatorily-zoned rims that are also magmatic, produced by resorbtion in the melt (Figs 7e and f). In some cases (Fig. 7e), there is evidence for several phases of zircon growth and resorbtion. The zircons display a discordant trend (Fig. 10a) with an upper intercept age of 2736 ± 12 Ma (MSWD = 0.96). There is no significant difference in age between the dark grain centres and the brighter rims (Figs 7e and f).

Sample HM11692 (206/7a-2, 2141.40 m) has mostly elongate euhedral to subhedral zircons with relatively indistinct oscillatory magmatic zoning. Some of the zircons have bright oscillatorily-zoned rims that are also magmatic. When plotted on a Wetherill concordia diagram, the data reveal a degree of scatter along the concordia line, precluding determination of an upper intercept age (Fig. 10b). However, the main group of zircons yield a concordia age of 2806 ± 8 Ma with an MSWD of 0.41 and probability of concordance of 0.84 (Fig. 10c). There appears to be a subordinate younger cluster at ca 2750 Ma.

Sample HM11694 (206/7a-2, 2593.30 m) has zircons that display a discordant trend (Fig. 10d) and yield an upper intercept age of 2753 ± 14 Ma (MSWD = 1.6) (Fig. 10e).

Sample HM22702 (206/12-1, 1716.65 m) has mostly elongate prismatic euhedral to subhedral zircons with typical magmatic oscillatory zoning patterns (Fig. 7g). There is evidence for several phases of zircon growth with both dark and bright areas under CL, but there is no significant difference in age between the two. The data define a discordant trend with an upper intercept age of ca. 2748 Ma (Fig. 10f). There is some scatter in the ages determined from the sample, which extend back to 2828 Ma. This is interpreted as indicating the presence of inherited zircons and suggests a relatively prolonged history of basement formation and stabilisation.

<u>Victory Sub-area</u>

Sample HM11698 (208/23-1, 2071.26 m) has equant to prismatic euhedral to subhedral zircons with typical igneous dark oscillatory zoning, many of which are surrounded by brighter oscillatorily-zoned rims that are also magmatic. These textures indicate the zircons underwent partial resorbtion in the melt prior to a later stage of crystallisation, but there is no significant difference in age between the dark grain centres and the brighter rims (Fig. 7h). The zircon data display a discordant trend (Fig. 10g) with an upper intercept age of 2776 ± 12 Ma (MSWD = 2.6).

Sample HM11699 (208/26-1, 3741.31 m) has zircons that are all close to concordia, but show significant scatter that precludes meaningful determination of an upper intercept age (Fig. 10h). The zircons have generally equant to stubby prismatic morphology and range from euhedral to subrounded. Many of the zircons are dark under CL with oscillatory magmatic zoning, but most of these have bright margins that display broad, mosaic-like textures that are typically of anatectic origin (Figs 7i and j). Other zircons are entirely bright under CL and show only anatectic textures. The probability density plot (Fig. 11a) shows the presence of two main groups, one in the 2720-2760 Ma range and one (possibly bimodal) in the 2800-2860 Ma range. This is the only sample in the data set that shows a significant difference in age between the dark cores and the bright rims (Fig. 7j), and the bimodal age distribution is believed to be a manifestation of at least two phases of zircon growth. The earlier phase (ca 2800-2860 Ma) generated zircons with typical oscillatory magmatic zoning that have dark CL (relatively high U), whereas the later phase (ca 2720-2760 Ma) generated zircons with anatectic textures, either as rims on the older grains or as entirely new grains.

Sample HM11700 (208/27-2, 1357 m) has zircons that are mostly concordant or near-concordant (Fig.10i), and yield a concordia age of 2789 ± 8 Ma with an MSWD of 0.76 and probability of concordance of 0.78 (Fig. 10j).

Results: U-Pb ages of detrital zircons in cover sequences

In addition to U-Pb zircon data that give direct measurement of basement ages, detrital zircon data may provide additional information. Four sandstone samples from the eastern part of the Faroe-Shetland Basin, ranging in age from Triassic to Early Cretaceous, have yielded almost exclusively Neoarchaean age spectra consistent with the data presented above. Three of these samples are located in reasonably close proximity to basement penetrations: HM12189 (204/27-1, 2094.65 m) and HM12194 (202/3-1A, 1642.50 m), which are located adjacent to the Lancaster sub-area, and HM12357 (206/4-1, 4115 m), which is close to the Greater Clair sub-area (Fig. 1). The other sample (HM12172, 213/23-1, 3598.36 m) has greater areal significance, since it is located further west in the basin, close to the Corona Ridge (Fig. 1), but it is nearest to the Victory sub-area.

<u>Lancaster sub-area</u>

Samples HM12189 (204/27-1, 2094.65 m) and HM12194 (202/3-1A, 1642.50 m) are both from sandstones of the Upper Jurassic Rona Member (Kimmeridge Clay Formation). The Rona sandstones were deposited by fan-deltas draining adjacent Archaean basement highs as a result of footwall uplift on normal faults bounding the Rona and Judd Highs (Fig 1; Verstralen et al. 1995). Both samples have detrital zircon populations that are overwhelmingly dominated by a 2680-2820 Ma group (Fig. 11b, c), consistent with local basement sourcing, although the sample from 202/3-1a contains a small number of younger zircons ranging from Palaeoproterozoic to Early Palaeozoic, suggesting minor involvement of other source materials.

Greater Clair sub-area

Sample HM12357 is from the Lower Cretaceous Royal Sovereign Formation at 4115 m depth in well 206/4-1, located immediately to the northwest of the Clair Field area (Fig. 1). The zircon population is almost exclusively Archaean, dominated by a Neoarchaean group between 2660 Ma and 2780 Ma with three older zircons with scattered ages between 2940 Ma and 3040 Ma (Fig. 11d).

Well 213/23-1 (Victory sub-area)

Sample HM12172 is from a Triassic sandstone at 3598.36 m depth in well 213/23-1, located significantly further basin-ward compared with all other samples in the study. Excluding two younger zircons at 1096 Ma and 1751 Ma, the spectrum is exclusively Archaean. In this case, however, the distribution is polymodal, with three main groups being apparent. The largest group lies between 2760-2900 Ma, with smaller groups at 2640-2740 Ma and 2920-2980 Ma (Fig. 11e).

Results: Lu-Hf data from basement rocks

The εHf(t) versus U-Pb crystallisation age diagram (Fig. 12) suggests the presence of three distinct groups within the sample set. The two basement samples from the Victory sub-area (HM11698: 208/23-1, 2071.26 m and HM11700: 208/27-2, 1357.11 m) have depleted mantle model ages of 3200-3300 Ma. These data indicate recycling of older crustal components of probable Palaeoarchaean age (extracted from the depleted mantle at ca 3200 to 3300 Ma) during the formation of new crust at ca 2750 to 2800 Ma.

In contrast, basement samples HM11686 (204/25-1, 2870.43 m, Lancaster sub-area), HM11691 (205/20-1, 2017.50 m, Greater Clair sub-area) and HM11711 (59-04/186DM, Sula Sgeir-Orkney sub-area) have younger model ages indicating extraction from the depleted mantle at ca 2900 to 3000 Ma. Therefore, this group represents recycling of Mesoarchaean crust during crustal formation events at ca 2750 to 2800 Ma. Crystalline basement samples HM11694 (206/7a-2, 2593.30 m, Greater Clair sub-area) and HM11705 (88/02, 13.00 m, Sula Sgeir-Orkney sub-area) have intermediate model ages, indicating they originated through melting of crust extracted from the depleted mantle during the Palaeoarchaean to Mesoarchaean.

Discussion and conclusions

The 17 basement age determinations presented here fall in a relatively narrow range between 2729-2826 Ma, similar to the 2700-2829 Ma ages obtained from 3 samples in the same area by Chambers et al. (2005). The geographic distribution of the 20 ages obtained is shown in Figure 13 – there is no clear difference in age ranges in any of the 4 sub-areas defined here.

By contrast, Hf isotope data from the Neoarchaean samples indicate that despite the relatively limited range in their U-Pb crystallisation ages, there is evidence for significant variation in their pre-crystallisation history (Figs 12 and 13). Extraction from the depleted mantle varied in age from ca 3200 Ma to ca 2900 Ma. The oldest Hf T_{DM} ages are from the Victory sub-area (wells 208/23-1 and 208/27-2), which is the most northeasterly segment in the study. Therefore, although the data set is limited, there is evidence for lateral variations in the Hf model age data that may indicate the existence of different crustal domains in the Neoarchaean of the west of Shetland area.

The uniformity in U-Pb crystallization ages of basement is strikingly consistent with the restricted range of Neoarchaean sources seen in detrital zircons preserved in sediments from various stratigraphic levels and locations in cover sequences in the eastern part of the Faroe-Shetland Basin. These include the Upper Jurassic Rona Formation in 202/3-1a and 204/27-1 and the Lower Cretaceous Royal Sovereign Formation in 206/4-1. The Triassic of 213/23-1 records two events in a similar but somewhat wider range (2640-2900 Ma), together with an earlier event between 2920-2980 Ma. This earlier group partially overlaps with one of the main zircon components (ca 2960-3020 Ma) seen in Archaean-sourced Albian sandstones from Kangerlussuaq, East Greenland (Whitham et al. 2004). In none of the cases described above is there any evidence for Proterozoic reworking of Archaean crust.

It should be noted that the discordant arrays of data visible in some samples in Figures 9 and 10 trend downwards to mainly Mesozoic lower intercept ages. The significance of these is not completely understood at present, but they most likely reflect lead loss during thermal events associated with Phanerozoic basin development. Further investigations will be aimed at clarifying the low temperature history of the basement during Mesozoic rifting.

Neoarchaean events in the Faroe-Shetland basement rocks

The U-Pb zircon analyses of intermediate to felsic basement gneisses from offshore boreholes in the FST reported herein and by Chambers et al. (2005) reveal that the majority of ages range from 2829 Ma to 2700 Ma. The analysed grains are primarily magmatic with oscillatory zoning, and many show evidence of several phases of crystallisation. In most cases, there is no significant difference in age between the different growth phases, but in one sample there is clear evidence for two distinct events. A small number of samples contain older outliers, interpreted as inherited. In contrast to Chambers et al. (2005), we have found no compelling textural evidence within the zircon grains for granulite facies metamorphism: the U-Pb ages are therefore believed to date the crystallisation of the igneous protoliths. The only clear example of complexity is seen in the zircons from 208/26-1, where the bimodal age distribution suggests at least two phases of zircon growth at ca 2800-2860 Ma and ca 2720-2760 Ma, with the latter group of zircons preserving evidence of anatectic textures, either as rims on the older grains or as entirely new grains.

The majority of the crystallisation ages fall between ca 2720 Ma and ca 2750 Ma, but show a bimodal distribution with a subordinate group between ca 2790 Ma and ca 2840 Ma (Fig. 14). It therefore appears that the Faroe-Shetland Terrane underwent a prolonged phase of stabilisation between ca 2840 Ma and 2700 Ma, with the main phase taking place between 2720-2750 Ma. From the presently-available data, there does not appear to be any geographic trend in the crystallisation ages (Fig. 13), although the detrital zircon data from well 213/23-1, further west than all the basement penetrations, indicates some older events, a picture that is also inferred from cover sediments in Kangerlussuaq on the conjugate margin (Whitham et al., 2004) (Fig. 11f).

Comparison with the Lewisian Gneiss Complex

The new data reported here provide a firmer basis for assessing the proposed correlation of the basement rocks west of Shetland with the Lewisian Gneiss Complex of mainland Scotland and the Outer Hebrides. The U-Pb ages obtained fall within, although mainly at the lower end of, the broad range of emplacement ages that have been established for different components of the Lewisian Gneiss Complex (ca 3135-2680 Ma; Wheeler et al. 2010 and references therein). Sm-Nd model ages obtained by Chambers et al. (2005) lie in the range 3300-2830 Ma and are similar to those obtained from the Lewisian Gneiss Complex (3000-2700 Ma; Whitehouse 1989, Corfu et al. 1993). The Hf isotope data reported here from zircons in the basement west of Shetland indicate extraction from the depleted mantle from ca 3300 Ma to ca 2900 Ma. The igneous protoliths of the two gneiss complexes were therefore both emplaced during the same protracted period of Palaeo- to Neoarchaean crustal growth in the North Atlantic region (e.g. Garde et al. 2000; Nutman et al. 2010; Tappe et al. 2011; Dyck et al. 2015).

The main difference between the two gneiss complexes is that the basement gneisses west of Shetland show no sign in the U-Pb zircon analyses of the ca 2500 Inverian and ca 1800-1700 Ma Laxfordian amphibolite to granulite facies events that have been documented from different parts of the Lewisian Gneiss Complex (e.g. Kinny et al. 2005; Wheeler et al. 2010, Mason 2015 and references therein). The prolonged crustal history associated with the onshore Lewisian Complex is also reflected in detrital zircon ages from sediment in Abhainn Caslavat, which is a stream draining Lewisian TTG gneisses of the Tarbert Terrane (Outer Hebrides). The zircons in this stream sample identify both the ca 2850-3100 Ma and ca 1675 Ma events identified in the Tarbert Terrane by Kinny et al. (2005), as well as a large group of zircons between ca 2550 Ma and ca. 2850 Ma (Morton et al. 2012).

Regional correlations with Greenland

It is widely believed that the Lewisian Gneiss Complex of mainland Scotland was continuous with the Nagssugtoqidian mobile belt of SE Greenland prior to opening of the North Atlantic Ocean (Fig. 15; Friend & Kinny 2001; Park 2005). They display a similar range of Meso- to Neoarchaean protolith and metamorphic ages and both were strongly reworked during the Palaeoproterozoic. In SE Greenland, the Nagssugtoqidian mobile belt is limited to the north by Archaean rocks of the Central Greenland-Rae Craton (Fig. 15; Nutman et al. 2008; Kolb 2014) which was a stable crustal block during the Palaeoproterozoic. Detrital zircons in Albian and Eocene sandstones from the Kangerlussuaq region of the Rae Craton indicate three Archaean tectonothermal events (ca 2700–2750 Ma, 2960-3020 Ma and 3180-3200 Ma), and no evidence for subsequent thermal reworking (Whitham et al. 2004). The absence of evidence for Palaeoproterozoic reworking of the basement west of Shetland suggests that the eastern continuation of the northern limit of Nagssugtoqidian deformation must run generally WNW-ESE close to the northern coastline of mainland Scotland (Fig. 15). The basement rocks forming the small islands of Sula Sgeir, North Rona, Sule Skerry and Stack Skerry (Walker 1931; Nisbet, 1961) all lie close to the projected terrane boundary. New work to determine the compositions, ages and affinities of these gneisses will help to better constrain the possible location and nature of this important crustal boundary.

Another Lewisian terrane?

The traditional view of the Lewisian Complex (following Sutton & Watson 1951) is of a single crustal block that underwent early Scourian high-grade tectonothermal events which were later divided into Badcallian and Inverian. These rocks were then intruded by Palaeoproterozoic mafic dykes (Scourie dykes) and were then heterogeneously reworked during a lower-grade Laxfordian event. A different interpretation was put forward by Friend & Kinny (2001) and Kinny et al. (2005) who subdivided the complex into many discrete terranes, characterised by different geochronological signatures that were thought to have been amalgamated during the Proterozoic. This prompted a resurgence of interest in the Lewisian Complex, although many workers have subsequently concluded that the number of terranes may in fact be relatively small (e.g. Park 2005; Mason 2012, 2015).

In many ways, the debate illustrates the problems in applying “upper crustal” concepts such as terranes to deep crustal rocks. To what extent do variations in protolith ages and/or timing and grade of metamorphic events reflect dissection and telescoping of heterogeneous crust as opposed to genuine accretion of terranes in the original Cordilleran sense? Notwithstanding this, the Lewisian Complex does incorporate Palaeoproterozoic volcanic arc material, accreted oceanic material, and preserves evidence for high-P metamorphism, all of which are indicative of the presence of at least one suture (e.g. Baba 1998; Park et al. 2001; Mason et al. 2004). Furthermore, the northernmost mainland terrane of Kinny et al. (2005), the Rhiconich Terrane (Fig. 13), is still regarded as being sufficiently different from the Lewisian rocks to the south of the bounding Laxford Shear

Zone to constitute a separate terrane (Goodenough et al. 2010). Thus, a terrane approach to the analysis of the Lewisian Complex is still justified.

There is at present insufficient geochemical and isotopic data to support a detailed comparison of the Faroe-Shetland basement with the Rhiconich Terrane. Clearly the main difference lies in the lack of significant Palaeoproterozoic reworking of the former crustal block. Any Nagssugtoqidian suture likely lies further south within the Lewisian Complex (Fig. 15; see Mason 2015 for details). As a working hypothesis, however, we suggest that the Faroe-Shetland basement should have formal terrane status, but without the implication that the boundary with the Rhiconich Terrane is necessarily an additional suture zone. We suggest that the "Faroe-Shetland Terrane" represents the eastwards continuation of the foreland to the Nagssugtoqidian orogen, in much the same way that the Hebridean Terrane (incorporating the Lewisian Complex) represents the foreland to the much younger Caledonian orogen east of the Moine Thrust Zone (Bluck et al. 1992).

Acknowledgements

We are grateful to BP and Sindri for supporting the U-Pb geochronological studies of basement and Triassic-Cretaceous sandstones in the Faroe-Shetland Basin, and to BGS for access to samples. Clair JVG also supported the analysis of the basement cores and we would like to particularly acknowledge the extensive help of Catherine Witt, Farkhad Sadikhov and Andrew Robertson (BP), Caroline Gill (Shell), and Andy Conway (formerly ConocoPhillips). Ian Chaplin is thanked for his excellent thin sectioning skills. Lydia-Marie Joubert and Madelaine Frazenburg (CAF, Stellenbosch University) are thanked for their help with CL imaging. Editor Randy Parrish and reviewers Ian Millar and Anonymous are thanked for their very positive and constructive comments.

Supplementary data files are provided at the end of this article or can be obtained from r.e.holdsworth@durham.ac.uk

REFERENCES

Baba, S. 1998. Proterozoic anticlockwise P–T path of the Lewisian Complex of South Harris, Outer Hebrides, NW Scotland. Journal of Metamorphic Geology, 16, 819-41.

Bluck, B.J., Gibbons, W. and Ingham, J.K. 1992. Terranes. In: Cope, J.C.W.Ingham, J.K. and Rawson, P.F. (eds), Atlas of palaeogeography and lithofacies. Memoir of the Geological Society, London, 13, 1-4.

Bouvier, A., Vervoort, J. and Patchett, P. 2008. The Lu–Hf and Sm–Nd isotopic composition of CHUR: constraints from unequilibrated chondrites and implications for the bulk composition of terrestrial planets. Earth and Planetary Science Letters, 273, 48-57.

Chambers, L., Darbyshire, F., Noble, S. and Ritchie, D. 2005. NW UK continental margin: chronology and isotope geochemistry. British Geological Survey Commissioned Report, CR/05/095.

Chauvel, C., Lewin, E., Carpentier, M., Arndt, N. T. and Marini, J. 2008. Role of recycled oceanic basalt and sediment in generating the Hf–Nd mantle array. Nature Geoscience, 1, 64-67.

Corfu, F., Heaman L.M. and Rogers, G. 1994. Polymetamorphic evolution of the Lewisian complex, NW Scotland, as recorded by U-Pb isotopic compositions of zircon, titanite and rutile. Contributions to Mineralogy and Petrology, 117, 215-228.

Crowley, Q.C., Key, R. and Noble, S.R. 2015. High-precision U-Pb dating of complex zircon from the Lewisian Gneiss Complex of Scotland using an incremental CA-ID-TIMS approach. Gondwana Research, 27, 1381-1391.

Davies, J.H.F.L. and Heaman, L.M. 2014. New U-Pb baddeleyite and zircon ages for the Scourie dyke swarm: a long-lived large igneous province with implications for the Palaeoproterozoic evolution of NW Scotland. Precambrian Research, 249, 180-198.

Dyck, B., Reno, B.L. and Kokfelt, T.F. 2015. The Majorqaq Belt: A record of Neoarchaean orogenesis during final assembly of the North Atlantic Craton, southern West Greenland. Lithos, 220, 253-271.

Flinn, D. 1985. The Caledonides of Shetland. In: Gee, D.G. and Sturt, B.A. (eds), The Caledonide Orogen: Scandinavia and Related Areas. Wiley & Sons, New York, 1159-1172.

Flinn, D. 1988. The Moine rocks of Shetland. In: Winchester, J.A. (ed.), Later Proterozoic Stratigraphy of the Northern Atlantic Regions. Blackie, Glasgow, 74-85.

Flinn, D. 2009. Uyea to North Roe Coast. Lewisian, Torridonian and Moine Rocks of Scotland. Geological Conservation Review Series, 34, Joint Nature Conservation Committee, Peterborough, 628-634.

Flinn, D., Frank, P.L., Brook, M. and Pringle, I.R. 1979. Basement-cover relations in Shetland. In: Harris, A.L., Holland, C.H. and Leake, B.E. (eds) The Caledonides of the British Isles - Reviewed. Geological Society, London, Special Publications, 8, 109-115.

Frei, D. and Gerdes, A. 2009. Precise and accurate in-situ U-Pb dating of zircon with high sample throughput by automated LA-SF-ICP-MS. Chemical Geology, 261, 261-270.

Friend, C.R.L. and Kinny, P.D. 2001. A reappraisal of the Lewisian Gneiss Complex: geochronological evidence for its tectonic assembly from disparate terranes in the Proterozoic. Contributions to Mineralogy and Petrology, 142, 198-218.

Friend, C.R.L., Strachan, R.A. and Kinny, P.D. 2008. U-Pb zircon dating of basement inliers within the Moine Supergroup, Scottish Caledonides: implications of Archaean protolith ages. Journal of the Geological Society, London, 165, 807-815.

Garde, A.A., Friend, C.R.L., Nutman, A.P. and Marker, M. 2000. Rapid maturation and stabilisation of middle Archaean continental crust: the Akia terrane, southern West Greenland. Bulletin of the Geological Society of Denmark, 47, 1-27.

Gerdes, A. and Zeh, A. 2006. Combined U–Pb and Hf isotope LA-(MC-)ICP-MS analyses of detrital zircons: Comparison with SHRIMP and new constraints for the provenance and age of an Armorican metasediment in Central Germany. Earth and Planetary Science Letters, 249, 47-61.

Gerdes, A. and Zeh, A. 2009. Zircon formation versus zircon alteration - new insights from combined U–Pb and Lu–Hf in-situ LA-ICP-MS analyses, and consequences for the interpretation of Archean zircon from the Central Zone of the Limpopo Belt. Chemical Geology, 261, 230-243.

Goodenough, K.M., Park, R.G., Krabbendam, M., Myers, J.S., Wheeler, J., Loughlin, S.C., Crowley, Q.G., Friend, C.R.L., Beach, A., Kinny, P.D. and Graham, R.H. 2010. The Laxford Shear Zone: an end-Archaean terrane boundary? In: Law, R.D., Butler, R.W.H., Holdsworth, R.E., Krabbendam, M., Strachan, R.A. (Eds.), Continental Tectonics and Mountain Building : The Legacy of Peach and Horne, Geological Society, London, Special Publications, 335, 103-120.

Goodenough, K.M., Crowley, Q.C., Krabbendam, M. and Parry, S.F. 2013. New U-Pb age constraints for the Laxford Shear Zone, NW Scotland: evidence for tectonomagmatic processes associated with the formation of a Palaeoproterozoic supercontinent. Precambrian Research, 233, 1-19.

Jackson, S., Pearson, N.J., Griffin, W.L. and Belousova, E.A. 2004. The application of laser ablation – inductively coupled plasma – mass spectrometry to in situ U–Pb zircon geochronology. Chemical Geology, 211, 47-69.

Kalsbeek, F., Austrheim, H., Bridgwater, D., Hansen, B.T., Pedersen, S., Taylor, P.N. 1993. Geochronology of Archaean and Proterozoic events in the Ammassalik area, South-East Greenland, and comparisons with the Lewisian of Scotland and the Nagssugtoquidian of West Greenland. Precambrian Research 62, 239–270.

Kinny, P.D. and Friend, C.R.L. 1997. U-Pb isotopic evidence for the accretion of different crustal blocks to form the Lewisian Complex of northwest Scotland. Contributions to Mineralogy and Petrology, 129, 326-340.

Kinny, P.D., Friend, C.R.L. and Love, G.J. 2005. Proposal for a terrane-based nomenclature for the Lewisian Gneiss Complex of NW Scotland. Journal of the Geological Society, London, 162, 175-186.

Kolb, J. 2014. Structure of the Palaeoproterozoic Nagssugtoqidian Orogen, South-East Greenland: model for the tectonic evolution. Precambrian Research 255, 809-822.

Ludwig, K. 2003. Isoplot/Ex version 3: a Geochronological toolkit for Microsoft Excel. Geochronology Center, Berkeley, USA.

Mason, A.J. 2012. Major early thrusting as a control on the Palaeoproterozoic evolution of the Lewisian Complex: evidence from the Outer Hebrides, NW Scotland. Journal of the Geological Society, London, 169, 201-212.

Mason, A.J. 2015. The Palaeoproterozoic anatomy of the Lewisian Complex, NW Scotland: evidence for two 'Laxfordian' tectonothermal cycles. Journal of the Geological Society, 173, 153-169, https://doi.org/10.1144/jgs2015-026

Mason, A.J., Temperley, S. and Parrish, R.R. 2004. New light on the construction, evolution and correlation of the Langavat Belt (Lewisian Complex), Outer Hebrides, Scotland: field, petrographic and geochronological evidence for an early Proterozoic imbricate zone. Journal of the Geological Society, London, 161, 837-848.

Mattinson, J.M. 2010. Analysis of the relative decay constants of ^{235}U and ^{238}U by multi-step CA-TIMS measurements of closed-system natural zircon samples. Chemical Geology, 275, 186-198.

Morton, A., Ellis, D., Fanning, M., Jolley, D. and Whitham, A. 2012. Heavy mineral constraints on Paleocene sand transport routes in the Faroe-Shetland Basin. In: Varming, T. and Ziska, H. (eds), Faroe Islands Exploration Conference: Proceedings of the 3rd Conference. Annales Societatis Scientiarum Faeroensis, 56, 59-83.

Nasdala, L., Hofmeister, W., Norberg, N., Mattinson, J.M., Corfu, F., Dörr, W., Kamo, S.L., Kennedy, A.K., Kronz, A., Reiners, P.W., Frei, D., Košler, J., Wan, Y., Götze, J., Häger, T., Kröner, A. and Valley, J.W. 2008. Zircon M257 – a homogeneous natural reference material for the ion microprobe U-Pb analysis of zircon. Geostandards and Geoanalytical Research, 32, 247-265.

Nisbet, H. C. 1961. The geology of North Rona. Transactions of the Geological Society of Glasgow, 24, 169-189.

Nutman, A.P., Kalsbeek, F. and Friend, C.R.L. 2008. The Nagssugtoqidian orogen in South-West Greenland: evidence for Palaeoproterozoic collision and plate assembly. American Journal of Science, 308, 529-572.

Nutman, A.P., Friend, C.R.L. and Heiss, J. 2010. Setting of the c. 2560 Qôrqut Granite complex in the Archaean crustal evolution of southern West Greenland. American Journal of Science, 310, 1081-1114.

Park, R.G. 2005. The Lewisian terrane model: a review. Scottish Journal of Geology, 41, 105-118.

Park, R.G., Tarney, J. and Connelly, J.N. 2001. The loch Maree Group: Palaeoproterozoic subduction-accretion complex in the Lewisian of NW Scotland. Precambrian Research, 105,205-226.

Passchier, C.W. and Trouw, R.A.J. 2005. Microtectonics (Second edition) Springer, Berlin.

Pringle, I.R. 1970. The structural geology of the North Roe area of Shetland. Geological Journal. 7, 147-170.

Ritchie, J.D., Noble, D., Darbyshire, F., Millar, I. and Chambers, L., 2011. Pre-Devonian. In: Ritchie, J.D., Ziska, H., Johnson, H. and Evans, D. (eds), Geology of the Faroe-Shetland Basin and adjacent areas. BGS Research Report RR/11/01, 71-78.

Simpson, C. 1985. Deformation of granitic rocks across the brittle-ductile transition. Journal of Structural Geology. 7, 503-11.

Sláma, J., Košler, J., Condon, D.J., Crowley, J.L., Gerdes, A., Hanchar, J.M., Horstwood, M.S.A., Morris, G.A., Nasdala, L., Norberg, N., Schaltegger, U., Schoene, B., Tubrett, M.N. and Whitehouse, M.J. 2008. Plešovice zircon - a new natural reference material for U-Pb and Hf isotopic microanalysis. Chemical Geology, 249, 1-35.

Stacey, J.S. and Kramers, J.D. 1975. Approximation of terrestrial lead isotope evolution by a two-stage model. Earth and Planetary Science Letters, 26, 207-221.

Stoker, M., Holford, S.P. and Hillis, R.R. 2018. A rift-to-drift record of vertical crustal motions in the Faroe–Shetland Basin, NW European margin: establishing constraints on NE Atlantic evolution. Journal of the Geological Society, 175, http://dx.doi.org/10.1144/jgs2017-076

Sutton J. and Watson J. 1951. The pre-Torridonian metamorphic history of the Loch Torridon and Scourie areas in the north-west Highlands, and its bearing on the chronological classification of the Lewisian. Quarterly Journal of the Geological Society, London, 106, 241-307.

Tappe, S., Smart, K.A., Pearson, D.G., Steenfelt, A. and Simonetti, A. 2011. Craton formation in Late Archaean subduction zones revealed by first Greenland eclogites. Geology, 39, 1103-1106.

Walker, F. 1931. The Geology of Skerryvore, Dubh Artach, and Sule Skerry. Geological Magazine, 68, 315-323.

Walker, S., Thirlwall, M.F., Strachan, R.A. and Bird, A.F. 2016. Evidence from Rb-Sr mineral ages for multiple orogenic events in Caledonides of the Shetland Islands, Scotland. Journal of the Geological Society, London, 173, 489-503.

Wheeler, J., Park, R.G., Rollinson, H.R. and Beach, A. 2010. The Lewisian Complex: insights into deep crustal evolution. In: Law, R.D., Butler, R.W.H., Holdsworth, R.E., Krabbendam, M. and Strachan, R.A. (eds), Continental Tectonics and Mountain Building: The Legacy of Peach and Horne. Geological Society, London, Special Publications, 335, 51-79.

Whitehouse, M.J. 1989. Sm-Nd evidence for diachronous crustal accretion in the Lewisian Complex of Northwest Scotland. In: Ashwal, L.D. (ed.), Growth of the Continental Crust. Tectonophysics, 161, 245-256.

Whitehouse, M.J. 1993. Age of the Corodale gneisses, South Uist. Scottish Journal of Geology, 29, 1-7.

Whitehouse, M.J. and Bridgewater, D. 2001. Geochronological constraints on Palaeoproterozoic crustal evolution and regional correlations of the northern Outer Hebridean Lewisian complex. Precambrian Research, 105, 227-245.

Whitham, A.G., Morton, A.C. and Fanning, C.M. 2004. Insights into Cretaceous–Palaeogene sediment transport paths and basin evolution in the North Atlantic from a heavy mineral study of sandstones from southern East Greenland. Petroleum Geoscience, 10, 61-72.

Verstralen, I., Hartley, A. and Hurst, A. 1995. The sedimentological record of a late Jurassic transgression: Rona Member (Kimmeridge Clay Formation equivalent), West Shetland Basin, UKCS. In: Hartley, A. J. and Prosser, D. J. (eds), Characterization of Deep Marine Clastic Systems. Geological Society, Special Publications, 94, 155-176.

Tables

Table I) *Basement samples from offshore west of Shetland included in the currrent U-Pb isotopic analysis study. Locations are shown in Fig. 1.*

Sample number	Site	Long deg	Long min	Lat deg	Lat min	Company	Site type	Sample Depth (m)	Lithology
SULA SGEIR-ORKNEY									
HM11705	88/02	59	12.54	6	18.10	BGS	Shallow bh	13.00	Granitic gneiss
HM11709	59-04/85DM	59	37.68	3	21.84	BGS	Seabed core		Granodioritic gneiss
HM11711	59-04/186DM	59	42.30	3	30.04	BGS	Seabed core		Granite
LANCASTER									
HM11686	204/25-1	60	10.42	4	2.17	Hess	Expl well	2870.43	Granodioritic-tonalitic gneiss
HM11687	204/26-1A	60	9.29	4	53.25	Hess	Expl well	2648.68	Granodioritic gneiss
HM11688	204/27-1	60	9.54	4	39.17	BP	Expl well	2136.20	Granite
HM11689	204/28-1	60	9.49	4	32.01	BP	Expl well	1941.55	Granodioritic gneiss
GREATER CLAIR									
HM11691	205/20-1	60	27.39	3	7.01	Total	Expl well	2017.50	Granitic gneiss
HM11692	206/7a-2	60	41.16	2	36.43	Total	Expl well	2141.40	Granodioritic gneiss
HM11694	206/7a-2	60	41.16	2	36.43	Total	Expl well	2593.30	Granodioritic gneiss
HM22702	206/12-1	60	59.77	2	76.72	Shell	Expl well	1716.63	Granodioritic gneiss
VICTORY									
HM11698	208/23-1	61	10.14	1	30.55	Lasmo	Expl well	2071.26	Granitic gneiss
HM11699	208/26-1	61	7.05	1	49.15	BP	Expl well	3741.31	Granodioritic gneiss
HM11700	208/27-2	61	8.04	1	38.50	BP	Expl well	1357.11	Mafic-granitic gneiss

Table II) *LA-SF-ICP-MS U-Th-Pb dating methodology at CAF, Stellenbosch University*

Laboratory & Sample Preparation	
Laboratory name	Central Analytical Facility, Stellenbosch University
Sample type / mineral	Magmatic and detrital zircons
Sample preparation	Conventional mineral separation, 1 inch resin mount, 1 µm polish to finish
Imaging	CL, LEO 1430 VP, 10 nA, 15 mm working distance
Laser ablation system	
Make, Model & type	ESI/New Wave Research, UP213, Nd:YAG
Ablation cell & volume	Custom build low volume cell, volume ca.3 cm^3
Laser wavelength	213 nm
Pulse width	3 ns
Fluence	2.5 J/cm^{-2}
Repetition rate	10 Hz
Spot size	30 µm
Sampling mode / pattern	30 µm single spot analyses
Carrier gas	100% He, Ar make-up gas combined using a T-connector close to sample cell
Pre-ablation laser warm-up (background collection)	40 seconds
Ablation duration	20 seconds
Wash-out delay	30 seconds
Cell carrier gas flow	0.3 l/min He
ICP-MS Instrument	
Make, Model & type	Thermo Finnigan Element2 single collector HR-SF-ICP-MS
Sample introduction	Via conventional tubing
RF power	1100 W
Make-up gas flow	1.0 l/min Ar
Detection system	Single collector secondary electron multiplier
Masses measured	202, 204, 206, 207, 208, 232, 233, 235, 238
Integration time per peak	4 ms
Total integration time per reading	Approx. 1 sec
Sensitivity	20000 cps/ppm Pb
Dead time	16 ns
Data Processing	
Gas blank	40 second on-peak
Calibration strategy	GJ-1 used as primary reference material, Plešovice and M127 used as secondary reference material (Quality Control)
Reference Material info	M127 (Nasdala et al. 2008; Mattinson 2010); Plešovice (Slama et al. 2008); GJ-1 (Jackson et al. 2004)
Data processing package used / Correction for LIEF	In-house spreadsheet data processing using intercept method for laser induced elemental fractionation (LIEF) correction
Mass discrimination	Standard-sample bracketing with $^{207}Pb/^{206}Pb$ and $^{206}Pb/^{238}U$ normalised to reference material GJ-1
Common-Pb correction, composition and uncertainty	204-method, Stacey and Kramers (1975) composition at the projected age of the mineral, 5% uncertainty assigned
Uncertainty level & propagation	Ages are quoted at 2 sigma absolute, propagation is by quadratic addition. Reproducibility and age uncertainty of reference material and common-Pb composition uncertainty are propagated.
Quality control / Validation	Plešovice: Wtd ave $^{206}Pb/^{238}U$ age = 337 ± 4 (2SD, MSWD = 0.2) M127: Wtd ave $^{206}Pb/^{238}U$ age = 520 ± 5 (2SD, MSWD = 0.8)
Other information	Detailed method description reported by Frei and Gerdes (2009)

Table III*) U-Pb ages of crystalline basement samples from the Hebridean margin.*
[1] Upper intercept U-Pb zircon age, this study. [2] Concordia U-Pb zircon age, this study. [3] Inferred U-Pb zircon age, this study. [4] Upper intercept U-Pb zircon age from Chambers et al. (2005) and Ritchie et al. (2011), obtained by ID-TIMS.

Sample number	Site	Lithology	U-Pb age (Ma)
‘SULA SGEIR-ORKNEY’			
HM11705	88/02, 13.00 m	Granitic gneiss	2754 ± 22[1]
HM11709	59-04/85DM	Granodioritic gneiss	2747 ± 7[2]
HM11711	59-04/186DM	Granite	2826 ± 5[2]
‘LANCASTER’			
	202/2-1, 1219.8 m	Quartzofeldspathic gneiss	2829 ± 46[4]
HM11686	204/25-1, 2870.43 m	Granodioritic-tonalitic gneiss	2729 ± 12[1]
HM11687	204/26-1A, 2648.68 m	Granodioritic gneiss	2733 ± 14[1], 2744 ± 16[2]
HM11688	204/27-1, 2136.20 m	Granite	2745 ± 15[1], 2739 ± 8[2]
HM11689	204/28-1, 1941.55 m	Granodioritic gneiss	2762 ± 13[1], 2793 ± 10[2]
	205/22-1, 3225.5 m	Dioritic gneiss	2700 ± 13[4]
GREATER CLAIR’			
HM11691	205/20-1, 2017.50 m	Granitic gneiss	2736 ± 12[1]
HM11692	206/7a-2, 2141.40 m	Granodioritic gneiss	2806 ± 8[2]
HM11694	206/7a-2, 2593.30 m	Granodioritic gneiss	2753 ± 14[1]
HM22702	206/12-1, 1716.63 m	Granodioritic gneiss	2748 ± 6[1]
	206/8-1A, 2310.9 m	Dioritic gneiss	2801.7 + 5.1/-4.6[4]
‘VICTORY’			
HM11698	208/23-1, 2071.26 m	Granitic gneiss	2776 ± 12[1]
HM11699	208/26-1, 3741.31 m	Granodioritic gneiss	ca 2720-2760, ca 2800-2860[3]
HM11700	208/27-2, 1357.11 m	Mafic-granitic gneiss	2789 ± 8[2]

Figures

Figure 1) Map showing basement distribution at seabed, structural elements (grey lines) and drilled occurrences of basement (red dots, with well numbers) and cover sedimentary rocks (yellow dots) offshore that are referred to in the current paper; a combined red/yellow dot means that both basement and cover were studied. Boxes show location of sub-areas whilst inset map shows map of main structural features. WBF=Walls Boundary Fault; MTZ = Moine Thrust Zone, NRU = North Roe/Uyea area, Shetland, SSK = Sule Skerry, SST = Sule Stack, NR = North Rona, SSG = Sula Sgeir

Figure 2) Location and lithologies of borehole cores from the Clair Ridge. a) location map and interpreted seismic reflection profile through the basement ridge showing location of the sub-horizontal 206/7a-2 well and core sections (numbered). b) Logs of basement cores showing lithologies, contact relationships, locations of main cross-cutting faults and radiometrically dated samples (blue dots).

Figure 3) Location and lithologies of borehole cores from other key borehole cores. a) location map showing locations of borehole cores shown here. b) Logs of basement cores – and in 3 cases overlying cover rocks - showing lithologies, contact relationships and locations of early fault rock types.

Figure 4) Representative core specimens of typical basement lithologies. A) granodioritic gneiss; b) granitic gneiss; c) porphyritic granite; d) fold in gneisses cut by shear zone (SZ) that host a porphyritic granite sheet (see Fig 2b, Core 6); e) foliated dioritic gneiss enclave hosted in granitic gneiss; f) metre-scale folding of gneisses. Core and depths shown in all cases. Note that the prevalence of samples from 206/8-8 is due to this core having been slabbed and polished.

Figure 5) Typical mineralogy and textures seen in basement cores, with core and depths shown for each sample. a) Cross-polars view of typical granodioritic gneiss with cuspate-lobate quartz-feldspar contacts and irregular undulose extinction in quartz. b) PPL view of typical cuspate-lobate mafics-feldspar contacts, with late alteration of mafics (?originally pyroxene) to fine grained amphibole and chlorite, and feldspars to sericite. c) Higher power PPL view of plagioclase grain (outlined) seeded with numerous small clinozoisite/epidote grains reflecting static greenschist facies retrogression. d) PPL view of intergrown aggregates of fine grained colourless amphibole, quartz, chlorite and calcite (all after pyroxene – location of relict grain outlined) with rim of yellow epidote. e) PPL view of fine quartz-epidote veins (labelled) overprinted by white mica-chlorite phyllonitic fabric (highlighted in yellow), with feldspar clasts showing fibrous pressure shadows. f) Hand specimen sample of gneiss and quartz-epidote veins (labelled) in basal Devonian Clair Group.

Figure 6) Selected minerals and microstructures from the samples analysed using U-Pb zircon geochronology. a) PPL view of sheared granitic gneiss with brown foliation-parallel pseudotachylyte with tensile offshoot suggesting top to the left sense of shear (from BGS thin section collection). b) Cross polar view of granodioritic-dioritic gneiss showing intergrown altered plagioclase, pyroxene, amphibole and secondary blue birefringent chlorite (dated sample HM11686). c) Cross polar view of marginal myrmekite (myrm) development in granitic gneiss, with weak subgrain development in quartz (dated sample HM11691). d) Cross polar view of granodioritic gneiss showing localised retrogression and breakdown of plagioclase to fine grained aligned aggregates of white mica and epidote, marginal subgrain rotation recrystallization in quartz and fibrous quartz-white mica tails (labelled) around feldspars (dated sample HM11692). e) PPL view of granodioritic gneiss showing fine aggregates of green amphibole, biotite and epidote, possibly after orthopyroxene (relict grain outlined) intergrown with plagioclase, quartz and a dark relict grain of altered clinopyroxene (CPx) (dated sample HM11699). f) PPL view of more mafic granitic gneiss showing intergrown plagioclase and brown partially altered pyroxene with prominent ore-rich alteration rims (dated sample HM11700).

Figure 7) Selected CL images of zircons from basement gneisses from the Sula Sgeir-Orkney, Lancaster, Greater Clair and Victory sub-areas. Spot size is 30 μm. A) HM11705: BGS borehole 88/02, analysis 106. B) HM11705: BGS borehole 88/02, analysis 107. C) HM11686: well 204/25-1, analysis 094. D) HM11688: well 204/27-1, analyses 022 and 023. E) HM11691: well 205/20-1, analyses 050 and 051. F) HM11691: well 205/20-1, analyses 063 and 064. G) HM22702: well 206/12-1, analysis 277. H) HM11698: well 208/23-1, analyses 012 and 013. I) HM11699: well 208/26-1, analysis 064. J) HM11699: well 208/26-1, analysis 050 and 051.

Figure 8) U-Pb isotopic compositions of zircons from the Sula Sgeir-Orkney sub-area displayed on Wetherill concordia diagrams, together with best estimates for zircon crystallisation ages. All data-point error ellipses are 2σ. A) Granitic gneiss, HM11705, BGS borehole 88/02, 13.00 m (all data); B) Granodioritic gneiss, HM11709, BGS shallow borehole 59-04/85DM (all data); C) Granodioritic gneiss, HM11709, BGS shallow borehole 59-04/85DM (showing zircons used for concordia age determination); D) Granite, HM11711, BGS shallow borehole 59-04/186DM (all data); E) Granite, HM11711, BGS shallow borehole 59-04/186DM (showing zircons used for concordia age determination).

Figure 9) U-Pb isotopic compositions of zircons from the Lancaster sub-area displayed on Wetherill concordia diagrams, together with best estimates for zircon crystallisation ages. All data-point error ellipses are 2σ. A) Granodioritic-tonalitic gneiss, HM11686, well 204/25-1, 2870.43 m (all data); B) Granodioritic-tonalitic gneiss, HM11686, well 204/25-1, 2870.43 m (showing data used for upper intercept age determination); C) Granodioritic gneiss, HM11687, 204/26-1A, well 2648.68 m (all data); D) Granodioritic gneiss, HM11687, 204/26-1A, well 2648.68 m (showing data used for upper intercept age determination); E) Granodioritic gneiss, HM11687, 204/26-1A, well 2648.68 m (showing data used for concordia age determination); F) HM11688, well 204/27-1, 2136.20 m (all data); G) HM11688, well 204/27-1, 2136.20 m (showing data used for upper intercept age determination); H) Granite, HM11688, well 204/27-1, 2136.20 m (showing data used for concordia age determination); I) Granodioritic gneiss, HM11689, well 204/28-1, 1941.55 m (showing all data and determination of upper intercept age); J) Granodioritic gneiss, HM11689, well 204/28-1, 1941.55 m (showing data used for concordia age determination).

Figure 10) U-Pb isotopic compositions of zircons from the Greater Clair and Victory sub-areas displayed on Wetherill concordia diagrams, together with best estimates for zircon crystallisation ages. All data-point error ellipses are 2σ.

<u>Greater Clair:</u> A) Granitic gneiss, HM11691, 205/20-1, 2017.50 m m (showing all data and determination of upper intercept age); B) Granodioritic gneiss, HM11692, 206/7a-2, 2141.40 m (all data); C) Granodioritic gneiss, HM11692, 206/7a-2, 2141.40 m (showing data used for concordia age determination); D) Granodioritic gneiss, HM11694, 206/7a-2, 2593.30 m (all data); E) Granodioritic

gneiss, HM11694, 206/7a-2, 2593.30 m (showing data used for upper intercept age determination); F) Granodioritic gneiss, HM22702, 206/12-1, 1716.63 m (showing all data and determination of upper intercept age).

Victory: G) Granitic gneiss, HM11698, 208/23-1, 2071.26 m (showing all data and determination of upper intercept age); H) Granodioritic gneiss, HM11699, 208/26-1, 3741.31 m (all data); I) Mafic-granitic gneiss, HM11700, 208/27-2, 1357.11 m (all data); J) Mafic-granitic gneiss, HM11700, 208/27-2, 1357.11 m (showing data used for concordia age determination).

Figure 11) Probability – density plots for selected samples of basement and cover sequences. Dark grey areas are zircons with <10% discordance, pale grey areas are zircons with >10% discordance. n = number of zircons with <10% discordance in total zircon data set. See Figure 1 for location of wells unless indicated otherwise. A) Granodioritic basement gneiss sample HM11699, Victory sub-area (208/26-1, 3741.31 m), 23 zircons with 99-101% concordance; B) Upper Jurassic Rona Member sandstone sample HM12189, Lancaster sub-area (204/27-1, 2094.65 m), n = 89/106. No zircons <2500 Ma detected. C) Upper Jurassic Rona Member sandstone sample HM12194, Lancaster sub-area (202/3-1A, 1642.50 m), n = 55/89. Spectrum also includes six younger zircons with <10% discordance at 494 Ma, 1014 Ma, 1353 Ma, 1551 Ma, 1960 Ma and 2127 Ma. D) Lower Cretaceous Royal Sovereign Formation sample HM12357, Greater Clair sub-area (206/4-1, 4115 m), n=84/99. Spectrum also includes one younger zircon with <10% discordance at 1692 Ma. E) Triassic sandstone sample HM12172, Victory sub-area (213/23-1, 3598.36 m), n=54/107. Spectrum also includes two younger zircons with <10% discordance at 1096 Ma and 1751 Ma. F) Lower Cretaceous (Albian) sample W4629, Kangerlussuaq, East Greenland, n=34/53. See Figure 15 for location. Data from Whitham et al. (2004), acquired by SHRIMP.

Figure 12) Hf isotope data displayed in the εHf(t) versus U-Pb age diagram. Symbols represent analyses of individual growth domains of zircon from the different samples. The depleted mantle (Chauvel et al. 2008) and the fields of the Neoarchaean to Palaeoarchaean crust, assuming a crustal ^{176}Lu/^{177}Hf of 0.0113, are shown for comparison.

Figure 13) Map based on Fig. 1 showing geographic distribution of U-Pb zircon and Hf T_{DM} ages from the basement gneisses, offshore west of Shetland (current study) and from Ritchie et al. (2011).

Figure 14) Probability – density plot of all zircon ages with <5% discordance from crystalline basement west of Shetland (n=313), showing the dominance of crystallisation ages between ca 2720 Ma and 2750 Ma, with a subordinate older group between ca 2790 Ma and 2840 Ma.

Figure 15) Simplified map showing the major age provinces within the British Isles, Ireland and Greenland, showing suggested location and extent of FST and its approximate southern boundary. MTZ = Moine Thrust Zone; WBF = Walls Boundary Fault; GGFZ = Great Glen Fault Zone; Nag = Nagssugtoqidian; CGC = Central Greenland (Rae) Craton; KB = Kangerlussuaq Basin; EGC = East Greenland Caledonides. RT = Rhiconich Terrane of Lewisian Gneiss Complex

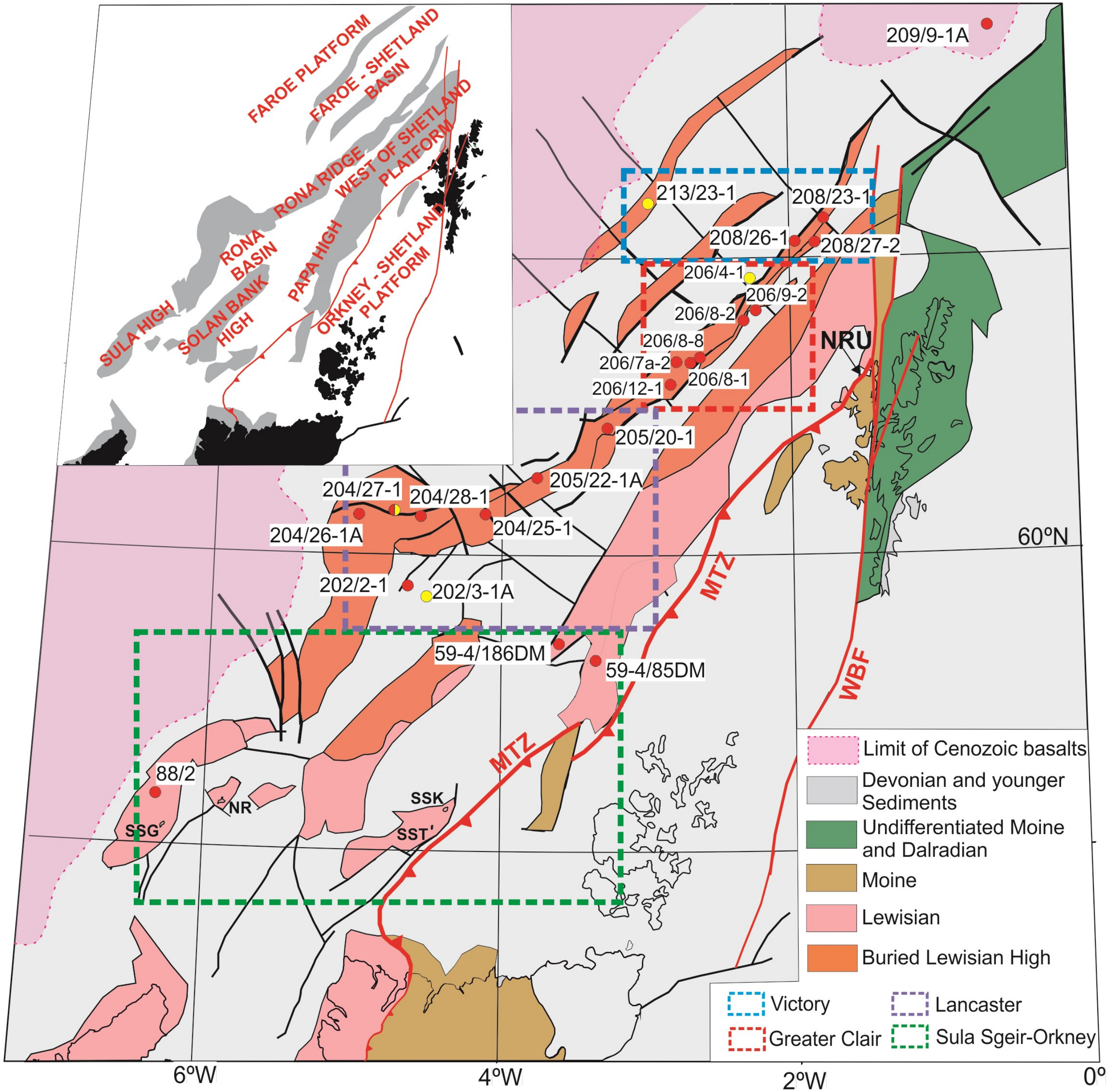

FAROE PLATFORM
FAROE - SHETLAND BASIN
WEST OF SHETLAND PLATFORM
RONA RIDGE
RONA BASIN
PAPA HIGH
ORKNEY - SHETLAND PLATFORM
SOLAN BANK HIGH
SULA HIGH
209/9-1A
213/23-1
208/23-1
208/26-1
208/27-2
206/4-1
206/9-2
206/8-2
206/8-8
206/7a-2
206/8-1
206/12-1
NRU
205/20-1
205/22-1A
204/27-1
204/28-1
204/26-1A
204/25-1
60ºN
202/2-1
202/3-1A
MTZ
59-4/186DM
59-4/85DM
WBF
MTZ
88/2
NR
SSK
SSG
SST
Limit of Cenozoic basalts
Devonian and younger Sediments
Undifferentiated Moine and Dalradian
Moine
Lewisian
Buried Lewisian High
Victory
Lancaster
Greater Clair
Sula Sgeir-Orkney
6ºW
4ºW
2ºW
0º

Figure 1

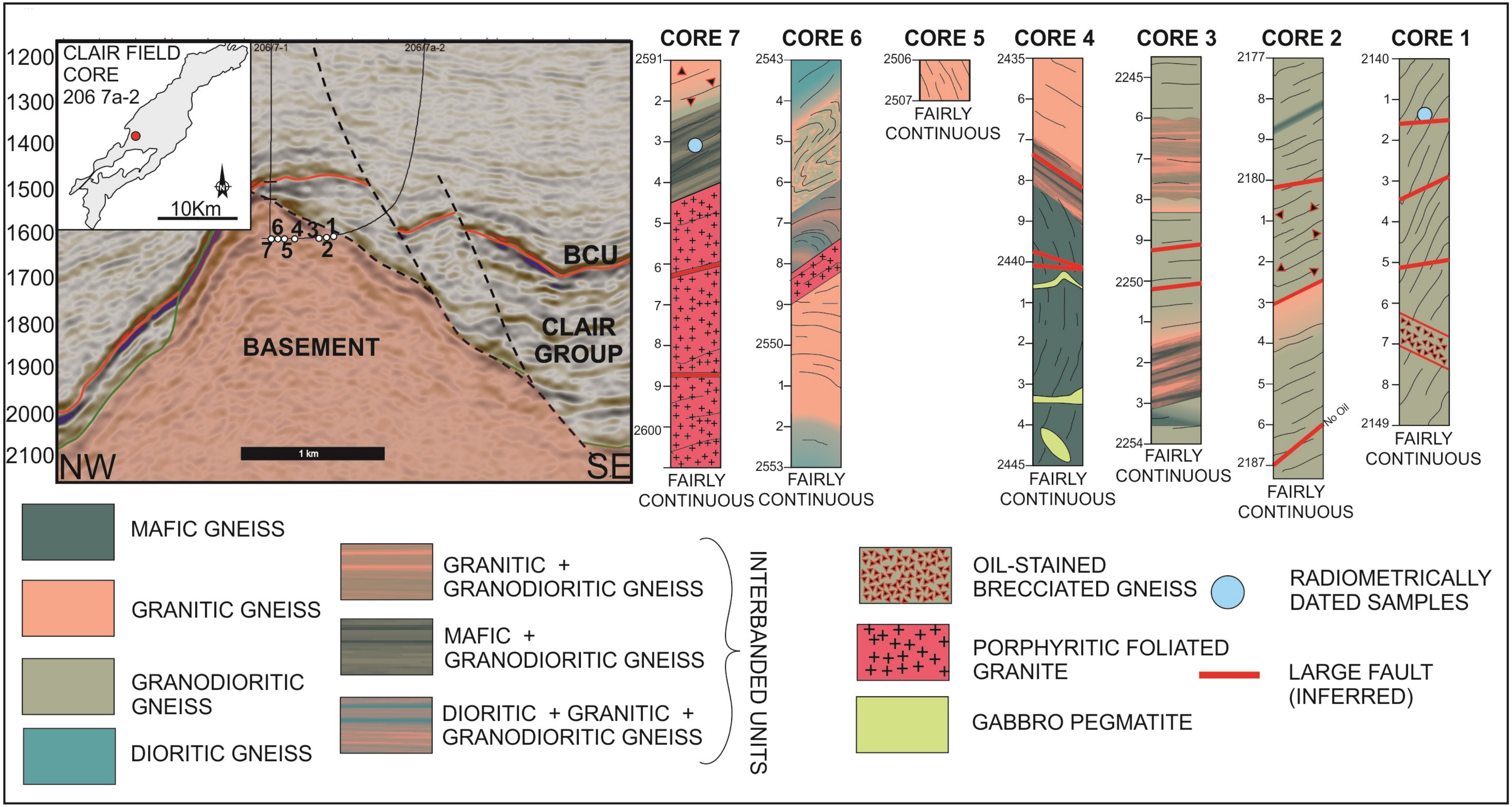
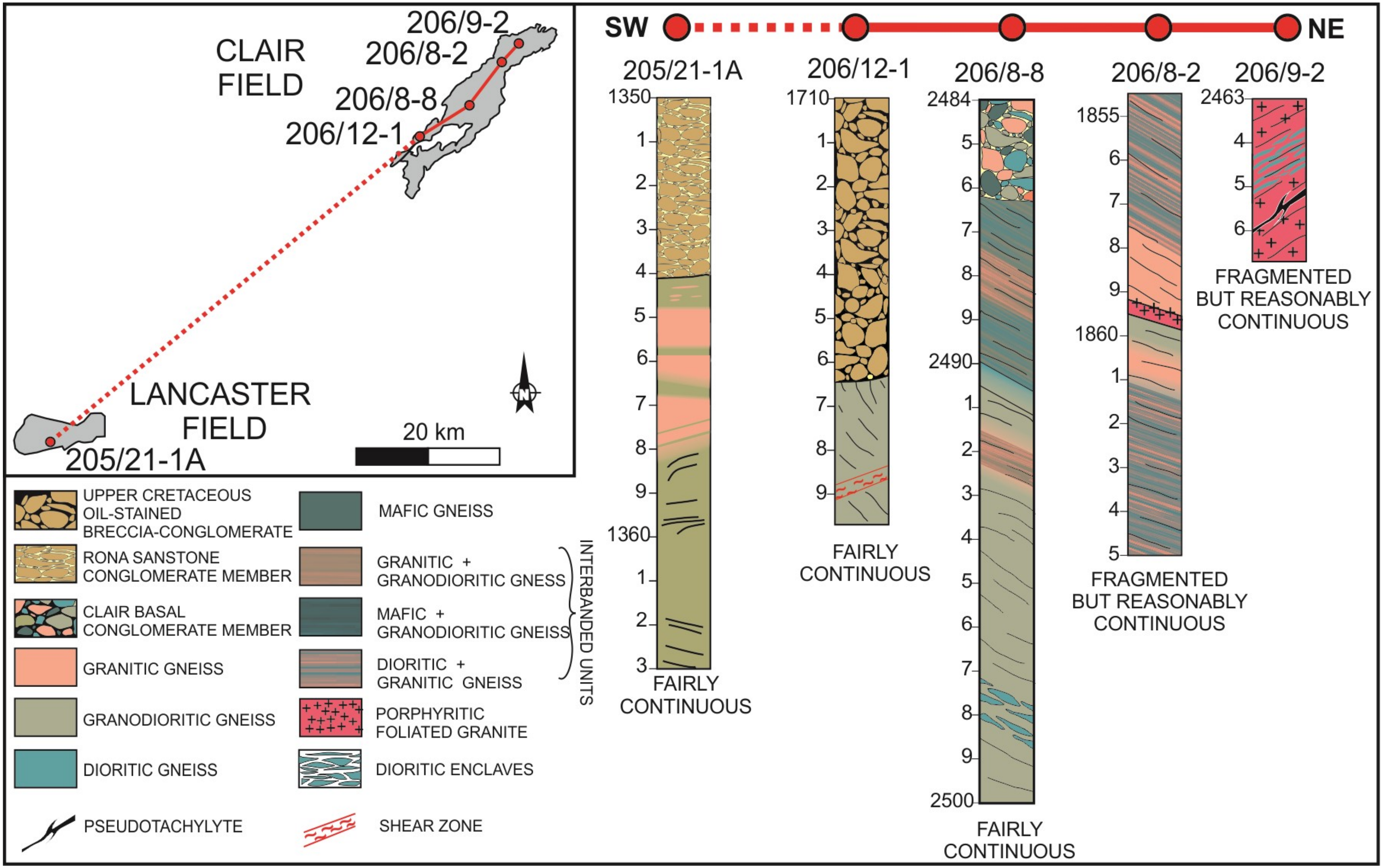

CLAIR FIELD CORE 206 7a-2
10Km
206/7-1
206/7a-2
BCU
CLAIR GROUP
BASEMENT
1 km
NW
SE
CORE 7
CORE 6
CORE 5
CORE 4
CORE 3
CORE 2
CORE 1
FAIRLY CONTINUOUS
No Oil
MAFIC GNEISS
GRANITIC GNEISS
GRANODIORITIC GNEISS
DIORITIC GNEISS
GRANITIC + GRANODIORITIC GNEISS
MAFIC + GRANODIORITIC GNEISS
DIORITIC + GRANITIC + GRANODIORITIC GNEISS
INTERBANDED UNITS
OIL-STAINED BRECCIATED GNEISS
PORPHYRITIC FOLIATED GRANITE
GABBRO PEGMATITE
RADIOMETRICALLY DATED SAMPLES
LARGE FAULT (INFERRED)

Figure 2



SW
NE
CLAIR FIELD
206/9-2
206/8-2
206/8-8
206/12-1
LANCASTER FIELD
205/21-1A
20 km
205/21-1A
206/12-1
206/8-8
206/8-2
206/9-2
1350
1360
1710
2484
2490
2500
1855
1860
2463
FAIRLY CONTINUOUS
FAIRLY CONTINUOUS
FAIRLY CONTINUOUS
FRAGMENTED BUT REASONABLY CONTINUOUS
FRAGMENTED BUT REASONABLY CONTINUOUS
UPPER CRETACEOUS OIL-STAINED BRECCIA-CONGLOMERATE
RONA SANSTONE CONGLOMERATE MEMBER
CLAIR BASAL CONGLOMERATE MEMBER
GRANITIC GNEISS
GRANODIORITIC GNEISS
DIORITIC GNEISS
PSEUDOTACHYLYTE
MAFIC GNEISS
GRANITIC + GRANODIORITIC GNESS
MAFIC + GRANODIORITIC GNEISS
DIORITIC + GRANITIC GNEISS
INTERBANDED UNITS
PORPHYRITIC FOLIATED GRANITE
DIORITIC ENCLAVES
SHEAR ZONE

Figure 3

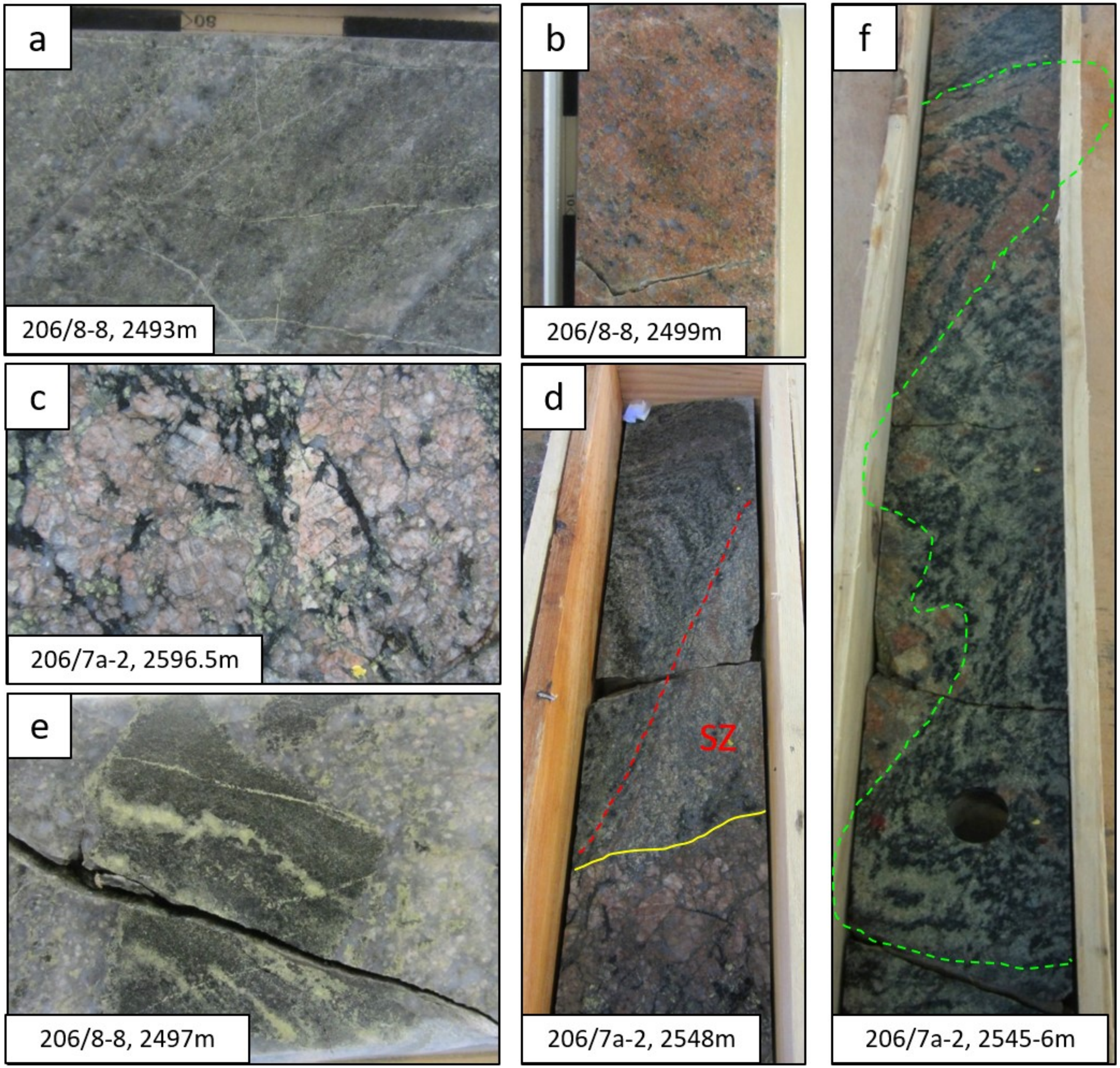

a
206/8-8, 2493m
b
206/8-8, 2499m
f
c
206/7a-2, 2596.5m
d
SZ
206/7a-2, 2548m
e
206/8-8, 2497m
206/7a-2, 2545-6m

Figure 4

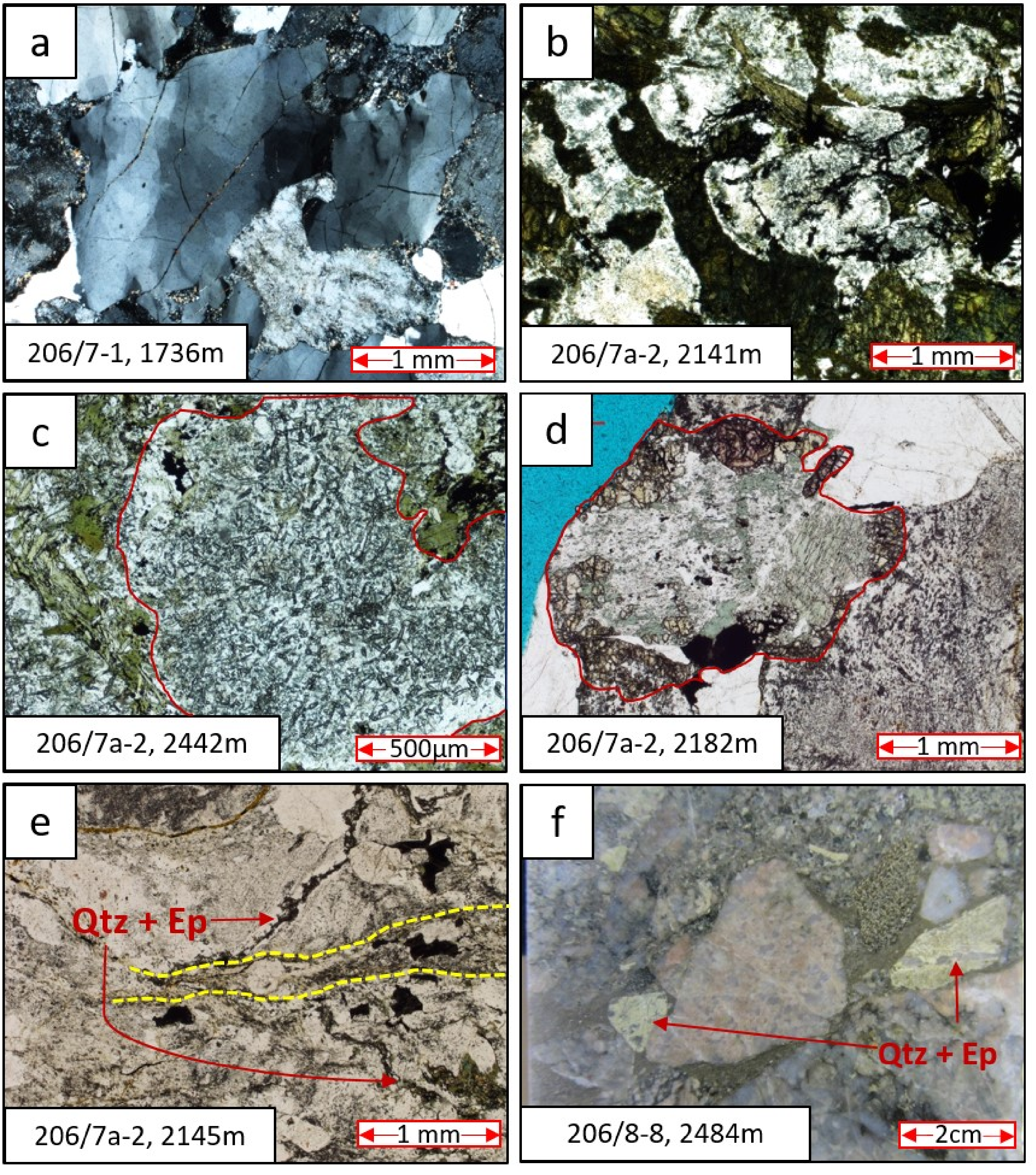

a
206/7-1, 1736m
1 mm
b
206/7a-2, 2141m
1 mm
c
206/7a-2, 2442m
500μm
d
206/7a-2, 2182m
1 mm
e
Qtz + Ep
206/7a-2, 2145m
1 mm
f
Qtz + Ep
206/8-8, 2484m
2cm

Figure 5

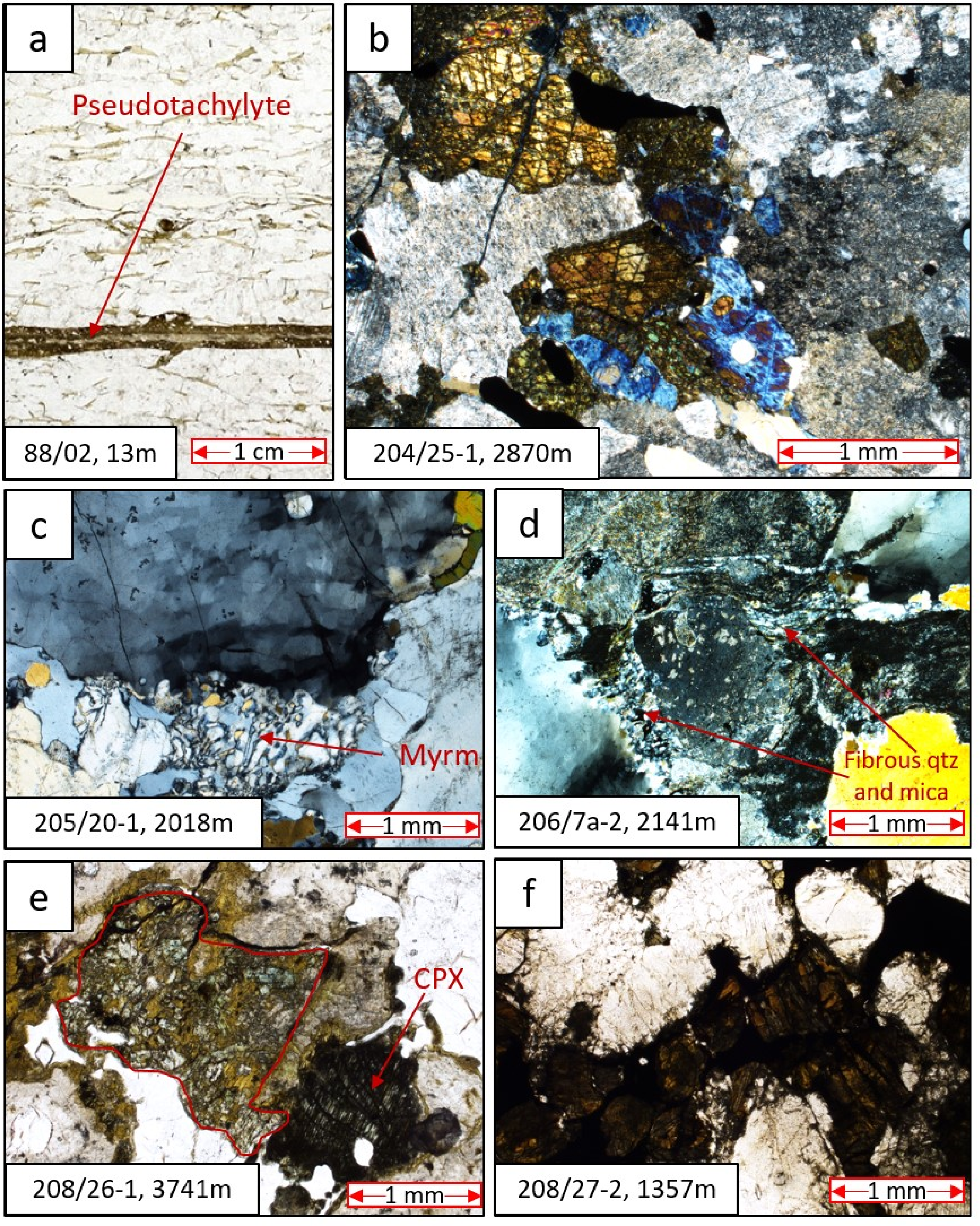

a
Pseudotachylyte
88/02, 13m
1 cm
b
204/25-1, 2870m
1 mm
c
Myrm
205/20-1, 2018m
1 mm
d
Fibrous qtz and mica
206/7a-2, 2141m
1 mm
e
CPX
208/26-1, 3741m
1 mm
f
208/27-2, 1357m
1 mm

Figure 6

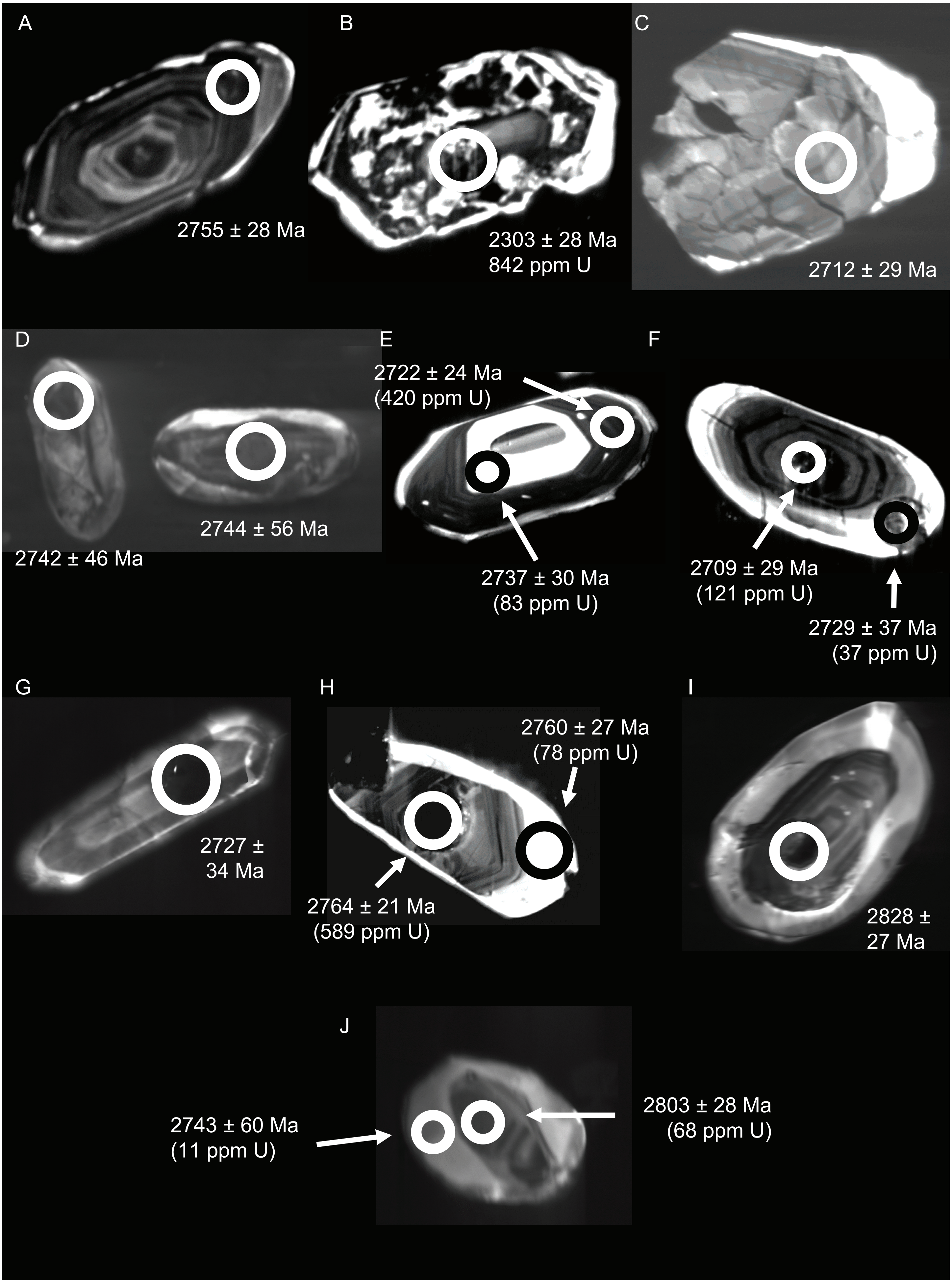

A
2755 ± 28 Ma
B
2303 ± 28 Ma
842 ppm U
C
2712 ± 29 Ma
D
2742 ± 46 Ma
2744 ± 56 Ma
E
2722 ± 24 Ma
(420 ppm U)
2737 ± 30 Ma
(83 ppm U)
F
2709 ± 29 Ma
(121 ppm U)
2729 ± 37 Ma
(37 ppm U)
G
2727 ± 34 Ma
H
2760 ± 27 Ma
(78 ppm U)
2764 ± 21 Ma
(589 ppm U)
I
2828 ± 27 Ma
J
2743 ± 60 Ma
(11 ppm U)
2803 ± 28 Ma
(68 ppm U)

Figure 7

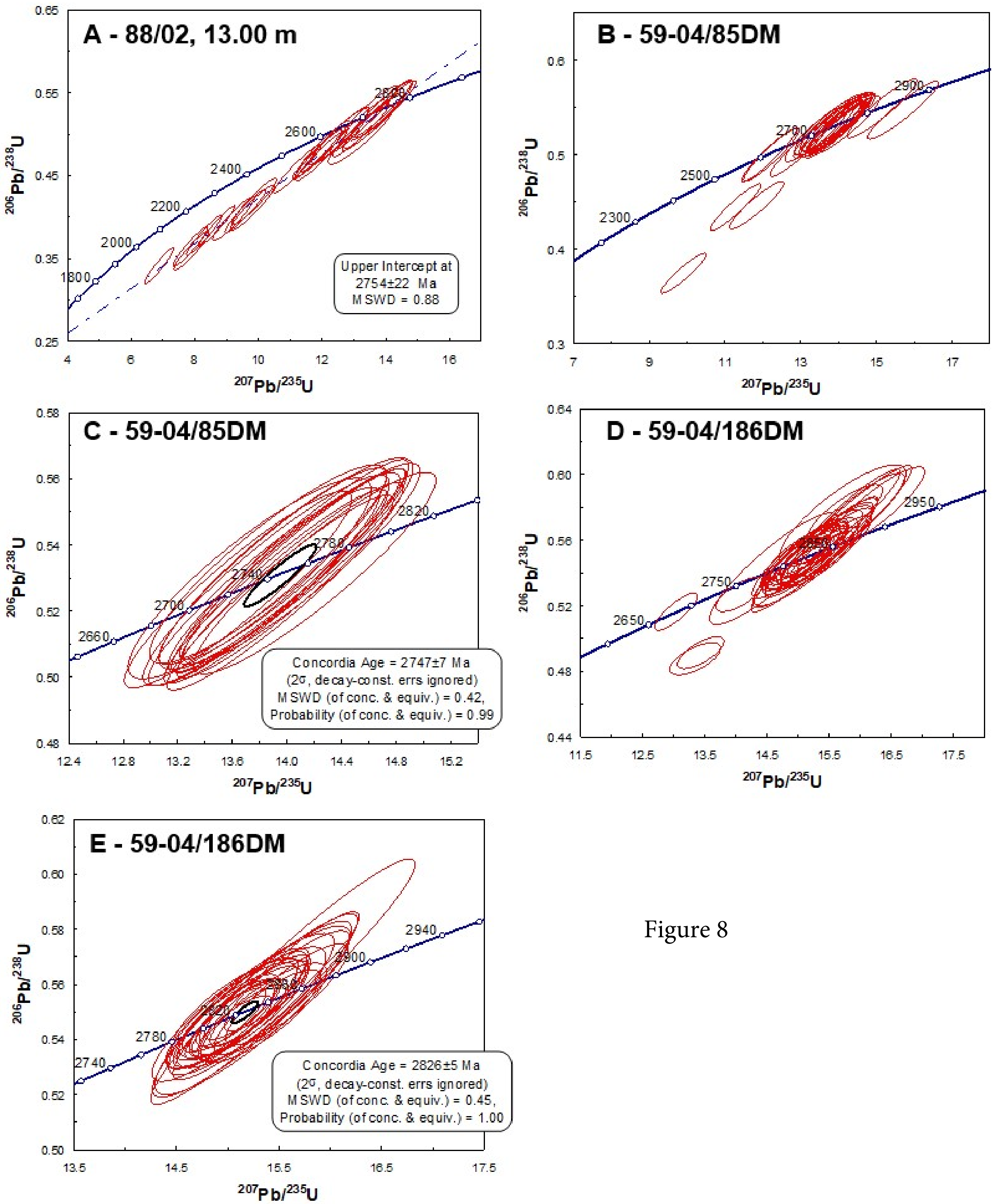

A - 88/02, 13.00 m
Upper Intercept at 2754±22 Ma MSWD = 0.88
B - 59-04/85DM
C - 59-04/85DM
Concordia Age = 2747±7 Ma (2σ, decay-const. errs ignored) MSWD (of conc. & equiv.) = 0.42, Probability (of conc. & equiv.) = 0.99
D - 59-04/186DM
E - 59-04/186DM
Concordia Age = 2826±5 Ma (2σ, decay-const. errs ignored) MSWD (of conc. & equiv.) = 0.45, Probability (of conc. & equiv.) = 1.00
206Pb/238U
207Pb/235U

Figure 8

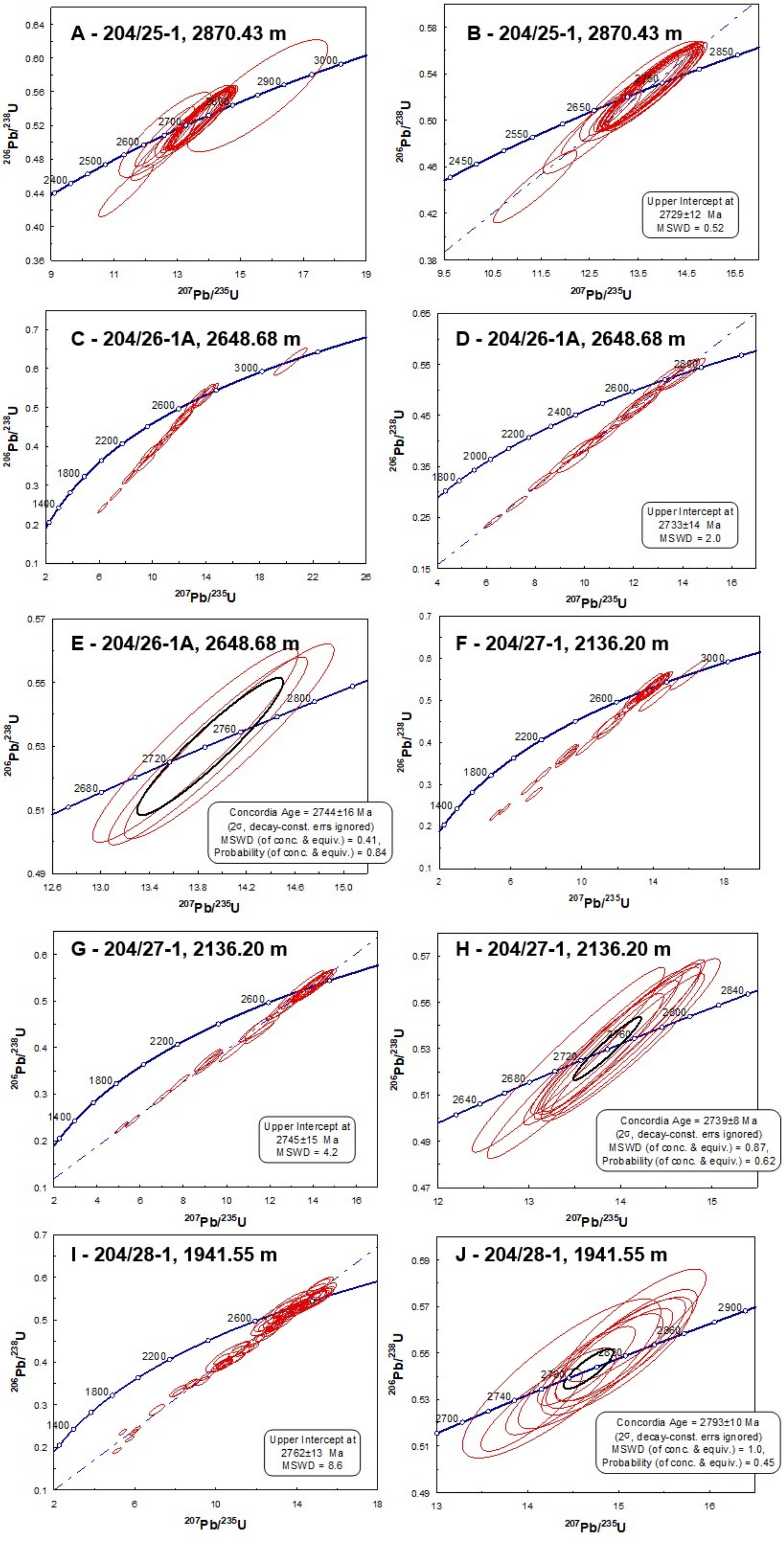

A - 204/25-1, 2870.43 m
B - 204/25-1, 2870.43 m
Upper Intercept at 2729±12 Ma MSWD = 0.52
C - 204/26-1A, 2648.68 m
D - 204/26-1A, 2648.68 m
Upper Intercept at 2733±14 Ma MSWD = 2.0
E - 204/26-1A, 2648.68 m
Concordia Age = 2744±16 Ma (2σ, decay-const. errs ignored) MSWD (of conc. & equiv.) = 0.41, Probability (of conc. & equiv.) = 0.84
F - 204/27-1, 2136.20 m
G - 204/27-1, 2136.20 m
Upper Intercept at 2745±15 Ma MSWD = 4.2
H - 204/27-1, 2136.20 m
Concordia Age = 2739±8 Ma (2σ, decay-const. errs ignored) MSWD (of conc. & equiv.) = 0.87, Probability (of conc. & equiv.) = 0.62
I - 204/28-1, 1941.55 m
Upper Intercept at 2762±13 Ma MSWD = 8.6
J - 204/28-1, 1941.55 m
Concordia Age = 2793±10 Ma (2σ, decay-const. errs ignored) MSWD (of conc. & equiv.) = 1.0, Probability (of conc. & equiv.) = 0.45
206Pb/238U
207Pb/235U

Figure 9

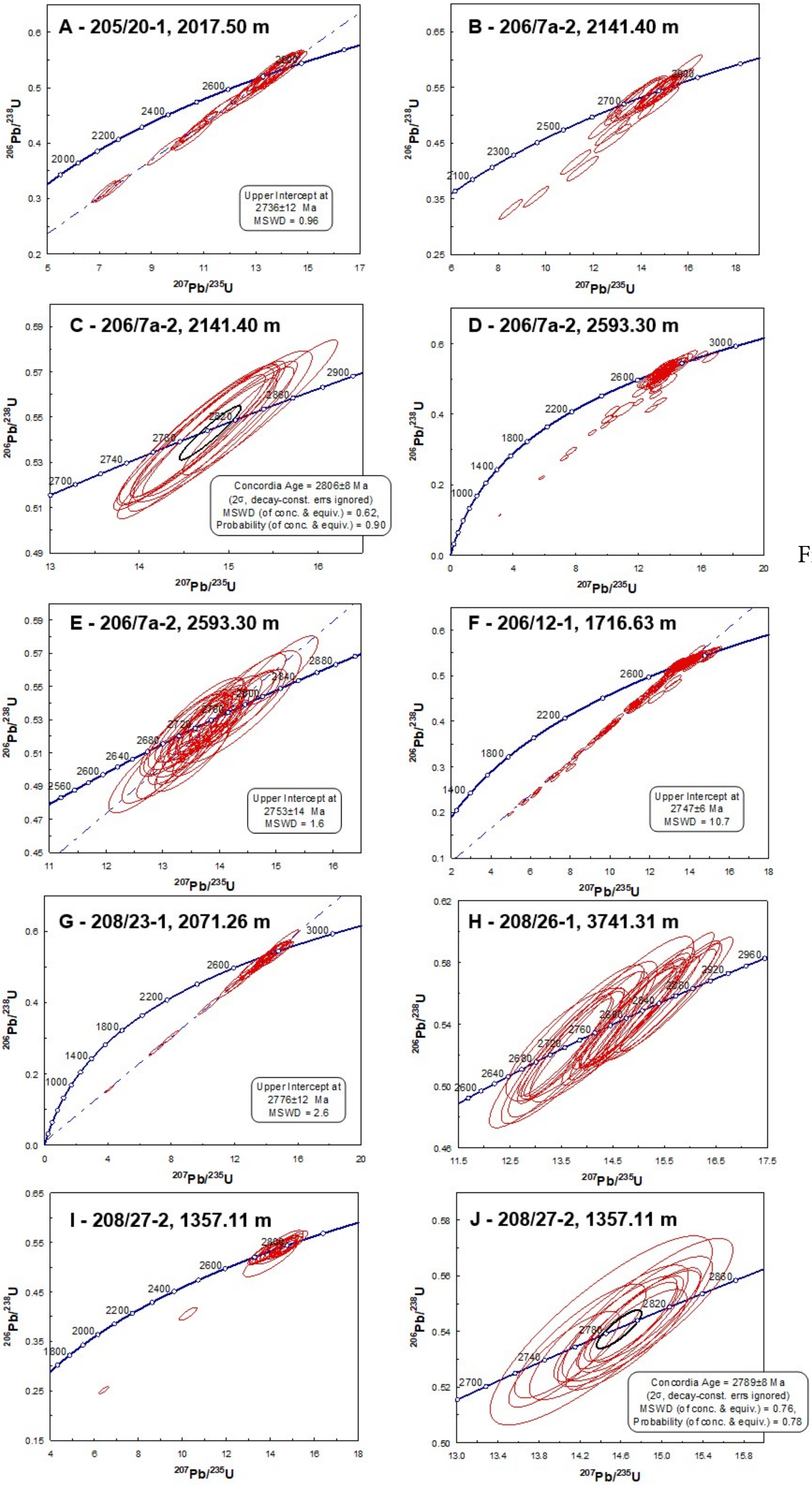
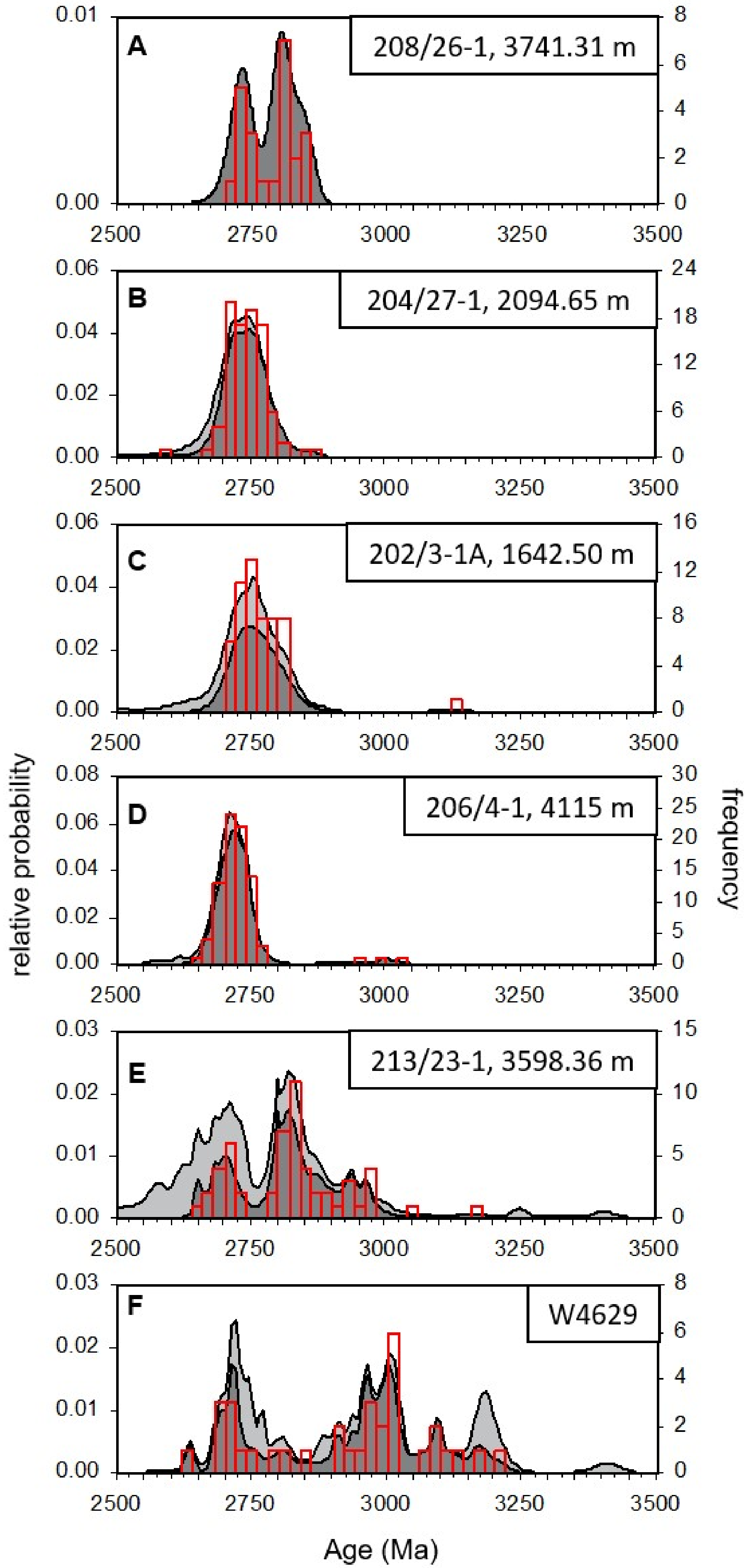

A - 205/20-1, 2017.50 m
Upper Intercept at
2736±12 Ma
MSWD = 0.96
B - 206/7a-2, 2141.40 m
C - 206/7a-2, 2141.40 m
Concordia Age = 2806±8 Ma
(2σ, decay-const. errs ignored)
MSWD (of conc. & equiv.) = 0.62,
Probability (of conc. & equiv.) = 0.90
D - 206/7a-2, 2593.30 m
E - 206/7a-2, 2593.30 m
Upper Intercept at
2753±14 Ma
MSWD = 1.6
F - 206/12-1, 1716.63 m
Upper Intercept at
2747±6 Ma
MSWD = 10.7
G - 208/23-1, 2071.26 m
Upper Intercept at
2776±12 Ma
MSWD = 2.6
H - 208/26-1, 3741.31 m
I - 208/27-2, 1357.11 m
J - 208/27-2, 1357.11 m
Concordia Age = 2789±8 Ma
(2σ, decay-const. errs ignored)
MSWD (of conc. & equiv.) = 0.76,
Probability (of conc. & equiv.) = 0.78
$^{206}Pb/^{238}U$
$^{207}Pb/^{235}U$

Figure 10



A
208/26-1, 3741.31 m
B
204/27-1, 2094.65 m
C
202/3-1A, 1642.50 m
D
206/4-1, 4115 m
E
213/23-1, 3598.36 m
F
W4629
relative probability
frequency
Age (Ma)

Figure 11

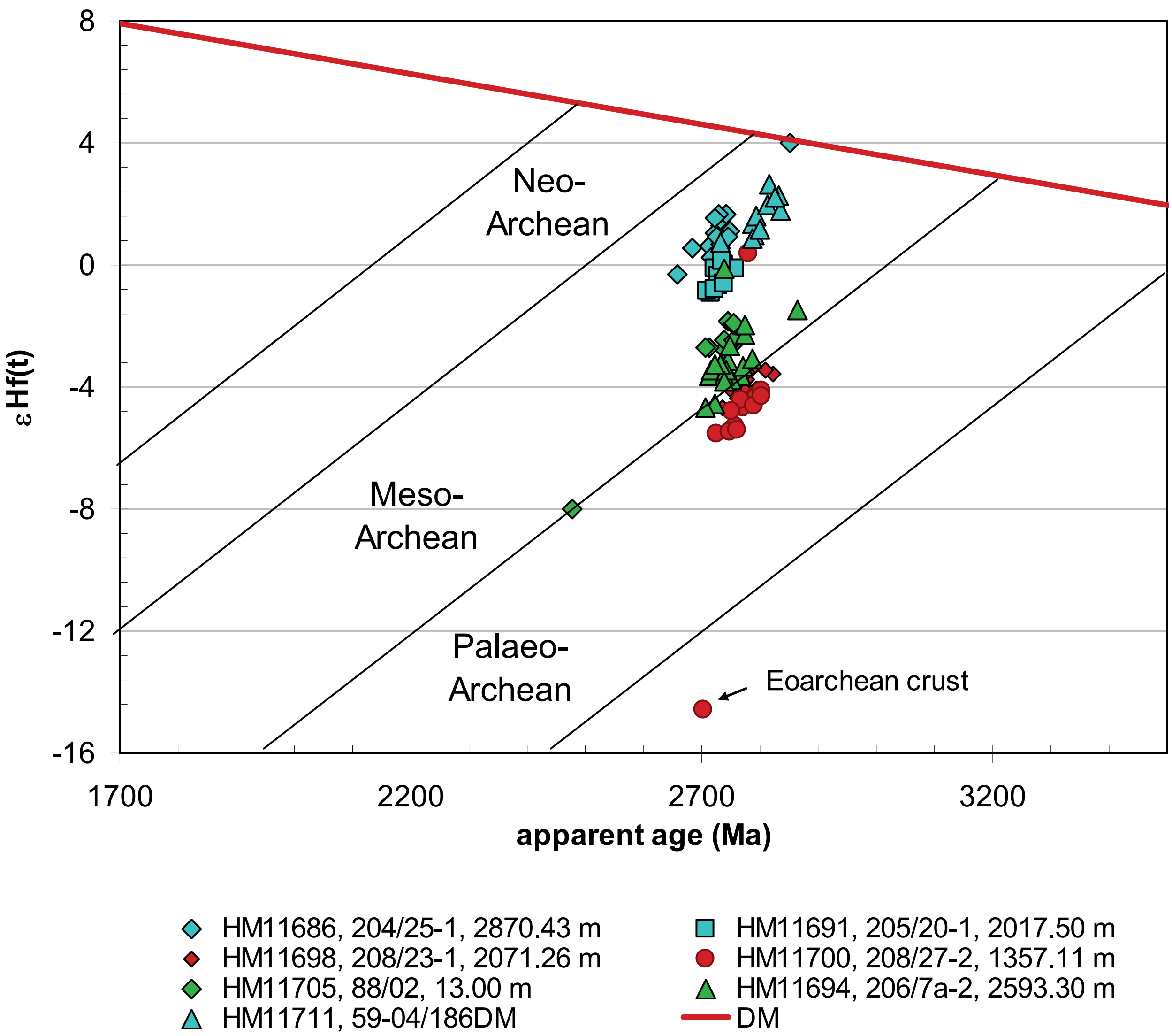
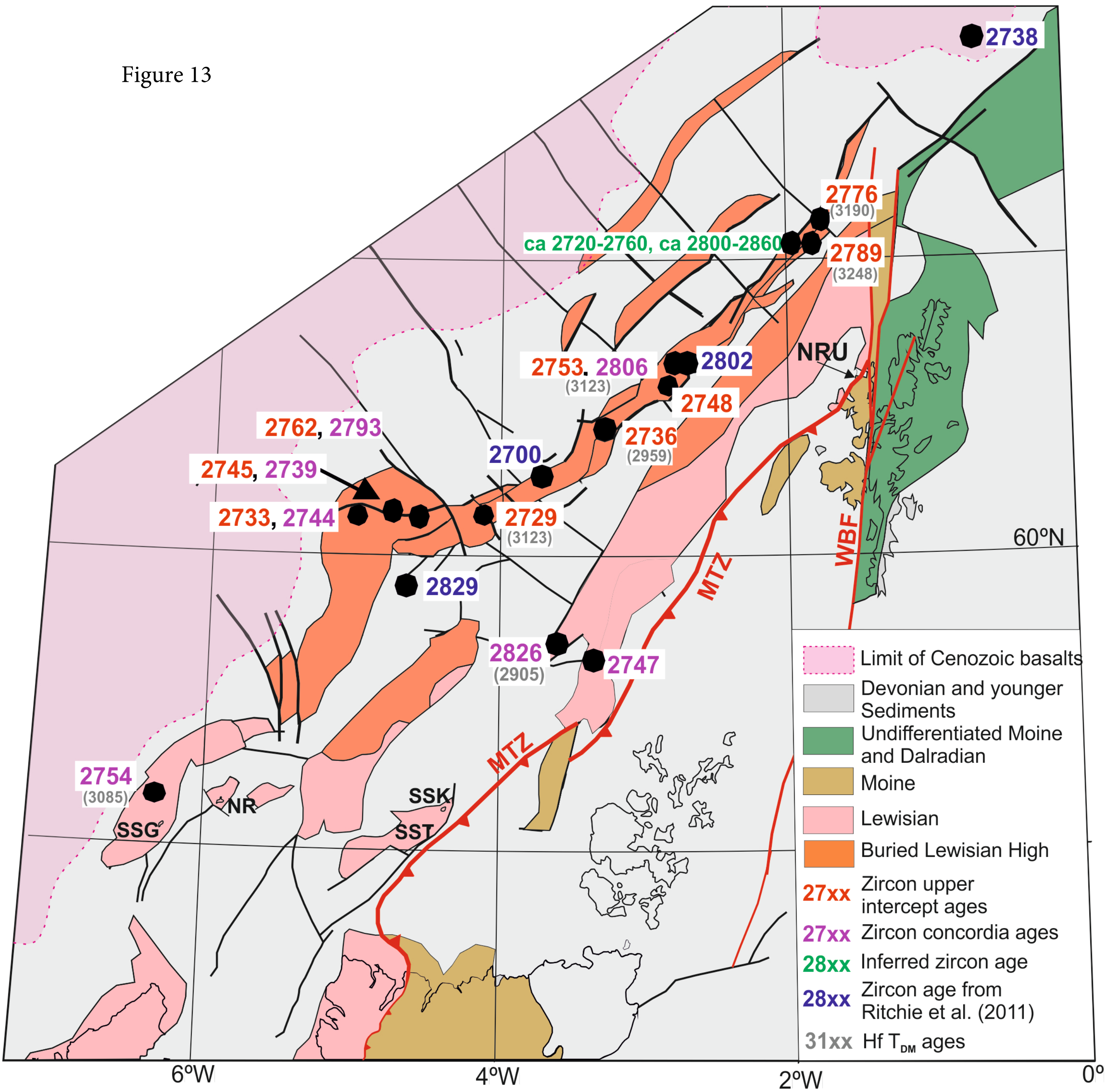

8
4
0
-4
-8
-12
-16
1700
2200
2700
3200
apparent age (Ma)
ε Hf(t)
Neo-
Archean
Meso-
Archean
Palaeo-
Archean
Eoarchean crust
HM11686, 204/25-1, 2870.43 m
HM11691, 205/20-1, 2017.50 m
HM11698, 208/23-1, 2071.26 m
HM11700, 208/27-2, 1357.11 m
HM11705, 88/02, 13.00 m
HM11694, 206/7a-2, 2593.30 m
HM11711, 59-04/186DM
DM

Figure 12

Figure 13



2738
2776
(3190)
ca 2720-2760, ca 2800-2860
2789
(3248)
NRU
2753. 2806
(3123)
2802
2748
2736
(2959)
2762, 2793
2745, 2739
2700
2733, 2744
2729
(3123)
60ºN
WBF
MTZ
2829
2826
(2905)
2747
2754
(3085)
NR
SSG
SSK
SST
6ºW
4ºW
2ºW
0º
Limit of Cenozoic basalts
Devonian and younger Sediments
Undifferentiated Moine and Dalradian
Moine
Lewisian
Buried Lewisian High
27xx Zircon upper intercept ages
27xx Zircon concordia ages
28xx Inferred zircon age
28xx Zircon age from Ritchie et al. (2011)
31xx Hf T_{DM} ages

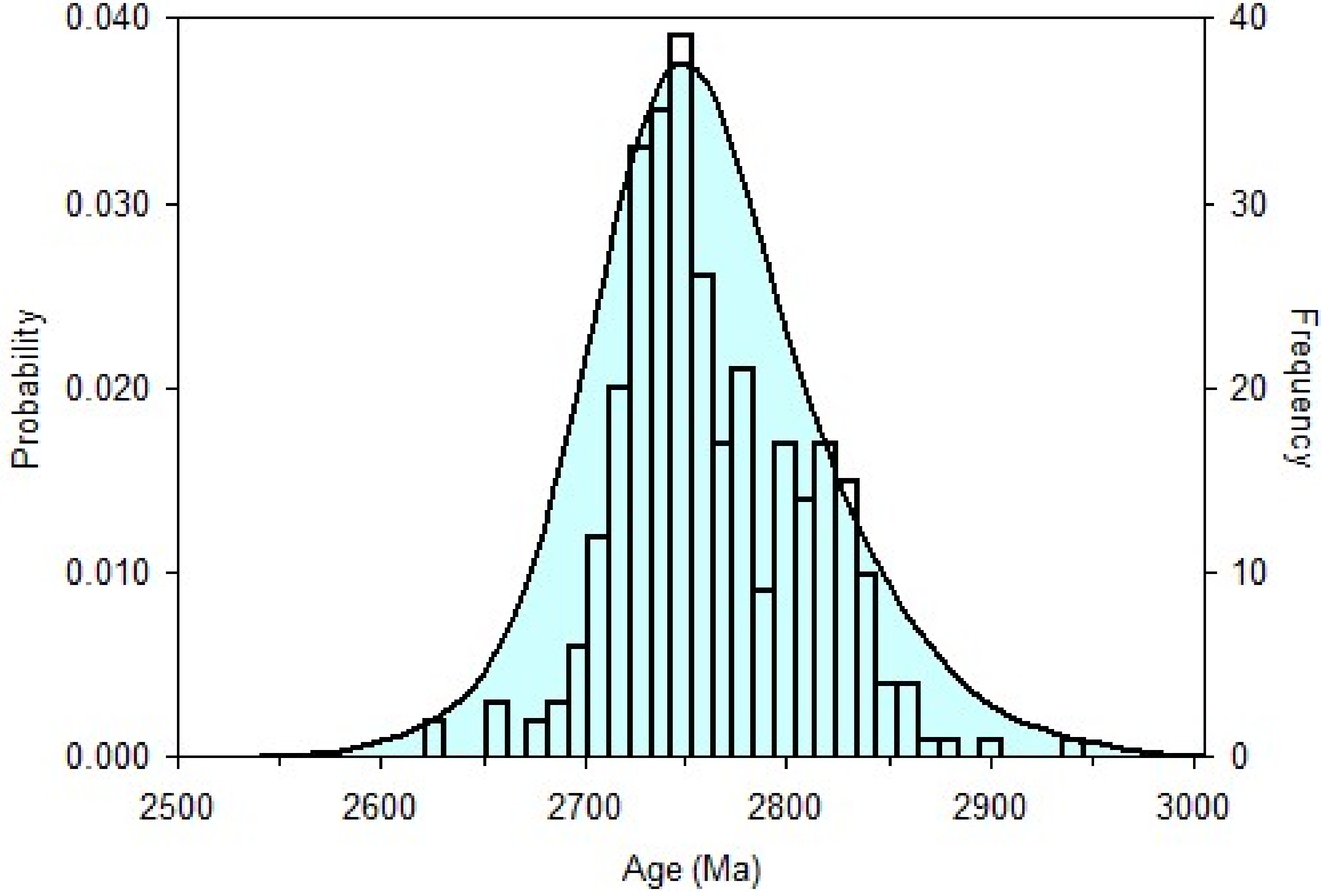
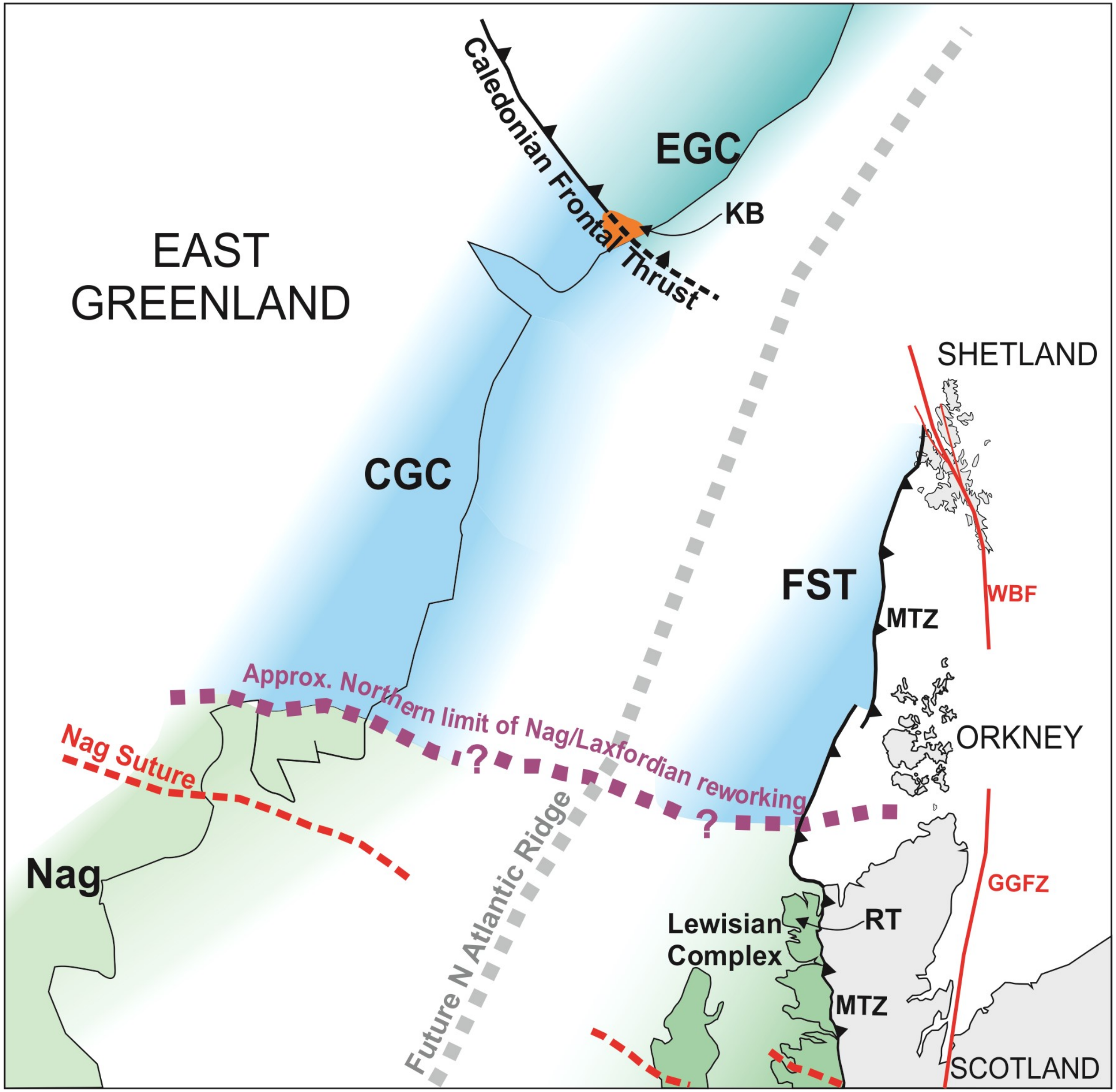

0.040
0.030
0.020
0.010
0.000
Probability
40
30
20
10
0
Frequency
2500
2600
2700
2800
2900
3000
Age (Ma)

Figure 14



Caledonian Frontal Thrust
EGC
KB
EAST
GREENLAND
CGC
SHETLAND
FST
MTZ
WBF
Approx. Northern limit of Nag/Laxfordian reworking
?
?
ORKNEY
Nag Suture
Future N Atlantic Ridge
GGFZ
Nag
RT
Lewisian
Complex
MTZ
SCOTLAND

Figure 15

					RATIOS							AGES [Ma]						Conc.	use for UI age
Sample	Analysis	U [ppm][a]	Pb [ppm][a]	Th/U[a]	$^{207}Pb/^{235}U$[b]	2 σ[d]	$^{206}Pb/^{238}U$[b]	2 σ[d]	rho[c]	$^{207}Pb/^{206}Pb$[e]	2 σ[d]	$^{207}Pb/^{235}U$	2 σ	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	%	
204/25-1, 2870.43 m	Zircon_Sample_085	111	56	0.45	12.78	0.70	0.503	0.026	0.95	0.184	0.003	2664	146	2626	113	2693	27	98	x
204/25-1, 2870.43 m	Zircon_Sample_086	70	37	0.75	13.86	0.79	0.530	0.029	0.94	0.190	0.004	2740	157	2743	120	2739	31	100	x
204/25-1, 2870.43 m	Zircon_Sample_087	40	22	0.59	13.83	0.83	0.531	0.030	0.93	0.189	0.004	2738	165	2747	125	2732	36	101	x
204/25-1, 2870.43 m	Zircon_Sample_088	45	24	0.84	13.54	1.02	0.525	0.035	0.89	0.187	0.006	2718	204	2720	148	2717	55	100	x
204/25-1, 2870.43 m	Zircon_Sample_089	112	59	0.97	13.71	0.77	0.527	0.028	0.95	0.189	0.003	2730	153	2728	119	2731	29	100	x
204/25-1, 2870.43 m	Zircon_Sample_090	108	57	0.75	13.84	0.80	0.526	0.029	0.94	0.191	0.004	2739	158	2726	121	2749	31	99	x
204/25-1, 2870.43 m	Zircon_Sample_091	7	3	0.11	12.64	1.20	0.509	0.041	0.85	0.180	0.009	2653	252	2652	176	2654	81	100	x
204/25-1, 2870.43 m	Zircon_Sample_092	82	44	0.54	13.81	0.81	0.531	0.029	0.94	0.189	0.004	2737	160	2744	123	2732	32	100	x
204/25-1, 2870.43 m	Zircon_Sample_093	96	50	0.69	13.63	0.77	0.526	0.028	0.95	0.188	0.003	2725	153	2727	119	2723	28	100	x
204/25-1, 2870.43 m	Zircon_Sample_094	154	80	0.74	13.41	0.76	0.522	0.028	0.95	0.187	0.003	2709	153	2706	118	2712	29	100	x
204/25-1, 2870.43 m	Zircon_Sample_098	76	40	0.67	13.91	0.84	0.531	0.030	0.94	0.190	0.004	2744	165	2744	126	2743	35	100	x
204/25-1, 2870.43 m	Zircon_Sample_099	42	18	0.57	11.38	0.70	0.443	0.025	0.93	0.186	0.004	2555	158	2364	114	2710	38	87	x
204/25-1, 2870.43 m	Zircon_Sample_100	202	106	0.42	13.71	0.76	0.527	0.028	0.96	0.189	0.003	2730	152	2727	118	2731	27	100	x
204/25-1, 2870.43 m	Zircon_Sample_101	75	40	0.57	13.74	0.81	0.527	0.029	0.94	0.189	0.004	2732	161	2730	123	2733	32	100	x
204/25-1, 2870.43 m	Zircon_Sample_102	4	2	0.21	15.55	1.82	0.555	0.054	0.84	0.203	0.013	2850	334	2847	225	2852	101	100	
204/25-1, 2870.43 m	Zircon_Sample_103	48	25	0.68	13.72	0.84	0.528	0.030	0.93	0.189	0.004	2731	167	2732	127	2730	36	100	x
204/25-1, 2870.43 m	Zircon_Sample_104	82	44	0.80	13.73	0.82	0.529	0.030	0.94	0.188	0.004	2731	163	2738	125	2726	33	100	x
204/25-1, 2870.43 m	Zircon_Sample_106	77	40	0.56	13.56	0.80	0.526	0.029	0.94	0.187	0.004	2719	160	2725	123	2715	32	100	x
204/25-1, 2870.43 m	Zircon_Sample_107	88	44	0.71	12.61	0.77	0.507	0.029	0.93	0.181	0.004	2651	162	2642	124	2658	36	99	x
204/25-1, 2870.43 m	Zircon_Sample_111	102	54	0.59	13.64	0.81	0.526	0.029	0.94	0.188	0.004	2725	162	2724	124	2726	33	100	x
204/25-1, 2870.43 m	Zircon_Sample_113	79	42	0.63	13.85	0.83	0.527	0.030	0.94	0.190	0.004	2739	165	2731	126	2746	34	99	x
204/25-1, 2870.43 m	Zircon_Sample_114	51	25	0.64	12.56	0.83	0.491	0.030	0.92	0.186	0.005	2647	174	2573	128	2704	43	95	x
204/25-1, 2870.43 m	Zircon_Sample_115	92	49	0.54	13.68	0.83	0.528	0.030	0.94	0.188	0.004	2728	165	2732	126	2724	34	100	x

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon
[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using ($^{207}Pb/^{206}Pb$)/($^{238}U/^{206}Pb$ * 1/137.88)
[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio
[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)
[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

Sample	Analysis	U [ppm][a]	Pb [ppm][a]	Th/U[a]	RATIOS							AGES [Ma]						Conc.	use for UI age	use for conc age
					$^{207}Pb/^{235}U$[b]	2σ[d]	$^{206}Pb/^{238}U$[b]	2σ[d]	rho[c]	$^{207}Pb/^{206}Pb$[e]	2σ[d]	$^{207}Pb/^{235}U$	2σ	$^{206}Pb/^{238}U$	2σ	$^{207}Pb/^{206}Pb$	2σ	%		
204/26-1A, 2648.68 m	Zircon_Sample_008	1520	491	0.01	8.43	0.38	0.323	0.014	0.96	0.189	0.002	2278	104	1806	69	2734	21	66	x	
204/26-1A, 2648.68 m	Zircon_Sample_009	865	307	0.01	9.09	0.44	0.355	0.016	0.94	0.186	0.003	2347	113	1959	77	2704	26	72	x	
204/26-1A, 2648.68 m	Zircon_Sample_010	945	303	0.25	8.18	0.38	0.320	0.014	0.95	0.185	0.003	2251	104	1791	69	2700	23	66	x	
204/26-1A, 2648.68 m	Zircon_Sample_011	131	63	0.33	12.46	0.62	0.481	0.022	0.94	0.188	0.003	2640	131	2531	98	2724	28	93	x	
204/26-1A, 2648.68 m	Zircon_Sample_013	318	136	0.51	11.07	0.53	0.428	0.019	0.95	0.188	0.003	2529	121	2297	87	2721	25	84	x	
204/26-1A, 2648.68 m	Zircon_Sample_014	257	136	0.54	13.88	0.67	0.528	0.024	0.95	0.191	0.003	2742	132	2735	102	2747	26	100	x	x
204/26-1A, 2648.68 m	Zircon_Sample_015	989	274	0.41	7.23	0.34	0.277	0.012	0.95	0.189	0.003	2140	101	1576	63	2737	24	58	x	
204/26-1A, 2648.68 m	Zircon_Sample_016	982	238	0.14	6.26	0.30	0.243	0.011	0.95	0.187	0.003	2014	95	1400	57	2719	24	51	x	
204/26-1A, 2648.68 m	Zircon_Sample_020	254	132	0.02	13.18	0.63	0.518	0.023	0.95	0.184	0.003	2692	128	2692	99	2693	24	100	x	
204/26-1A, 2648.68 m	Zircon_Sample_021	159	98	0.37	20.33	1.01	0.618	0.029	0.94	0.239	0.004	3107	154	3101	115	3111	26	100		
204/26-1A, 2648.68 m	Zircon_Sample_023	131	61	0.25	12.12	0.66	0.469	0.023	0.92	0.188	0.004	2614	142	2478	103	2721	35	91	x	
204/26-1A, 2648.68 m	Zircon_Sample_024	436	170	0.09	10.12	0.48	0.390	0.018	0.95	0.188	0.003	2446	116	2121	82	2728	24	78	x	
204/26-1A, 2648.68 m	Zircon_Sample_025	299	108	0.14	9.53	0.52	0.360	0.018	0.92	0.192	0.004	2390	130	1982	85	2759	35	72	x	
204/26-1A, 2648.68 m	Zircon_Sample_027	674	268	0.13	10.29	0.51	0.397	0.018	0.94	0.188	0.003	2461	121	2154	85	2725	27	79	x	
204/26-1A, 2648.68 m	Zircon_Sample_028	150	80	0.19	14.06	0.71	0.532	0.025	0.94	0.192	0.003	2754	138	2748	105	2758	29	100	x	x
204/26-1A, 2648.68 m	Zircon_Sample_029	446	183	0.14	10.78	0.52	0.410	0.019	0.95	0.191	0.003	2505	120	2214	85	2750	25	80	x	
204/26-1A, 2648.68 m	Zircon_Sample_033	217	83	0.29	9.71	0.53	0.380	0.019	0.92	0.185	0.004	2407	131	2078	89	2699	35	77	x	
204/26-1A, 2648.68 m	Zircon_Sample_034	262	118	0.07	11.75	0.58	0.449	0.021	0.94	0.190	0.003	2585	128	2392	93	2740	28	87	x	
204/26-1A, 2648.68 m	Zircon_Sample_035	161	75	0.25	12.25	0.61	0.467	0.022	0.94	0.190	0.003	2624	131	2472	96	2743	29	90	x	
204/26-1A, 2648.68 m	Zircon_Sample_036	329	156	0.03	12.31	0.61	0.473	0.022	0.94	0.189	0.003	2628	131	2495	97	2733	28	91	x	
204/26-1A, 2648.68 m	Zircon_Sample_037	247	131	0.38	13.78	0.69	0.530	0.025	0.94	0.188	0.003	2735	137	2743	105	2729	29	100	x	x

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon
[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using $(^{207}Pb/^{206}Pb)/(^{238}U/^{206}Pb * 1/137.88)$
[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio
[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)
[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

					RATIOS							AGES [Ma]						Conc.	use for UI age	use for conc age
Sample	Analysis	U [ppm][a]	Pb [ppm][a]	Th/U[a]	$^{207}Pb/^{235}U$[b]	2 σ[d]	$^{206}Pb/^{238}U$[b]	2 σ[d]	rho[c]	$^{207}Pb/^{206}Pb$[e]	2 σ[d]	$^{207}Pb/^{235}U$	2 σ	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	%		
204/27-1, 2136.20 m	Zircon_Sample_007	843	273	0.02	7.82	0.37	0.324	0.015	0.96	0.175	0.004	2210	104	1811	72	2605	42	70	x	
204/27-1, 2136.20 m	Zircon_Sample_008	381	203	0.24	13.85	0.68	0.533	0.025	0.96	0.189	0.005	2740	134	2753	106	2730	42	101	x	x
204/27-1, 2136.20 m	Zircon_Sample_009	1773	429	0.01	5.65	0.27	0.242	0.011	0.97	0.169	0.004	1923	91	1397	57	2550	41	55	x	
204/27-1, 2136.20 m	Zircon_Sample_010	171	90	0.53	13.79	0.69	0.528	0.025	0.96	0.189	0.005	2735	137	2734	107	2736	46	100	x	x
204/27-1, 2136.20 m	Zircon_Sample_011	596	258	0.07	11.54	0.55	0.433	0.020	0.96	0.193	0.005	2568	123	2320	90	2771	42	84	x	
204/27-1, 2136.20 m	Zircon_Sample_012	291	155	0.45	14.08	0.69	0.532	0.025	0.96	0.192	0.005	2755	135	2749	105	2760	44	100	x	x
204/27-1, 2136.20 m	Zircon_Sample_013	1760	400	0.02	5.11	0.25	0.227	0.011	0.96	0.163	0.004	1837	89	1321	56	2486	43	53	x	
204/27-1, 2136.20 m	Zircon_Sample_014	1012	297	0.36	7.02	0.34	0.293	0.014	0.96	0.174	0.004	2114	103	1658	68	2592	43	64	x	
204/27-1, 2136.20 m	Zircon_Sample_015	219	108	0.42	12.89	0.64	0.493	0.023	0.96	0.190	0.005	2672	132	2584	101	2739	46	94	x	
204/27-1, 2136.20 m	Zircon_Sample_016	564	222	0.20	10.28	0.50	0.393	0.019	0.96	0.190	0.005	2461	121	2136	86	2741	44	78	x	
204/27-1, 2136.20 m	Zircon_Sample_020	917	342	0.35	9.26	0.46	0.373	0.018	0.96	0.180	0.005	2364	118	2044	84	2653	44	77	x	
204/27-1, 2136.20 m	Zircon_Sample_021	48	22	0.22	11.66	0.66	0.446	0.023	0.90	0.189	0.009	2577	145	2380	101	2737	78	87	x	
204/27-1, 2136.20 m	Zircon_Sample_022	394	211	0.90	14.03	0.73	0.536	0.027	0.96	0.190	0.005	2752	143	2765	113	2742	46	101	x	x
204/27-1, 2136.20 m	Zircon_Sample_023	84	45	0.29	13.96	0.74	0.532	0.027	0.95	0.190	0.007	2747	146	2751	113	2744	56	100	x	x
204/27-1, 2136.20 m	Zircon_Sample_024	134	70	0.23	13.43	0.86	0.525	0.033	0.97	0.186	0.006	2711	174	2721	138	2703	54	101	x	x
204/27-1, 2136.20 m	Zircon_Sample_025	127	66	0.35	13.51	0.79	0.518	0.029	0.96	0.189	0.006	2716	159	2692	123	2734	53	98	x	x
204/27-1, 2136.20 m	Zircon_Sample_026	206	110	0.43	13.99	0.73	0.534	0.027	0.96	0.190	0.006	2749	143	2759	112	2742	50	101	x	x
204/27-1, 2136.20 m	Zircon_Sample_027	215	105	0.46	12.65	0.66	0.488	0.024	0.96	0.188	0.006	2654	139	2561	106	2725	51	94	x	
204/27-1, 2136.20 m	Zircon_Sample_028	2006	556	0.16	7.30	0.38	0.277	0.014	0.96	0.191	0.006	2149	111	1578	69	2751	47	57		
204/27-1, 2136.20 m	Zircon_Sample_029	482	244	0.34	14.10	0.74	0.505	0.025	0.96	0.202	0.006	2756	144	2637	108	2845	48	93		
204/27-1, 2136.20 m	Zircon_Sample_033	232	86	0.13	9.12	0.49	0.373	0.019	0.95	0.178	0.006	2350	127	2042	90	2630	55	78	x	
204/27-1, 2136.20 m	Zircon_Sample_034	355	156	0.66	11.34	0.61	0.440	0.023	0.95	0.187	0.006	2551	137	2351	101	2715	53	87	x	
204/27-1, 2136.20 m	Zircon_Sample_035	739	269	0.07	9.12	0.49	0.365	0.019	0.96	0.181	0.006	2350	126	2004	89	2665	52	75	x	
204/27-1, 2136.20 m	Zircon_Sample_036	367	206	0.26	16.02	0.88	0.562	0.030	0.96	0.207	0.007	2878	158	2877	122	2879	52	100		
204/27-1, 2136.20 m	Zircon_Sample_037	128	68	0.19	14.11	0.80	0.534	0.029	0.95	0.192	0.007	2757	156	2758	121	2757	58	100	x	x

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using $(^{207}Pb/^{206}Pb)/(^{238}U/^{206}Pb * 1/137.88)$

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

					RATIOS							AGES [Ma]						Conc.	use for UI age	use for conc age
Sample	**Analysis**	**U [ppm][a]**	**Pb [ppm][a]**	**Th/U[a]**	**$^{207}Pb/^{235}U$[b]**	**2 σ[d]**	**$^{206}Pb/^{238}U$[b]**	**2 σ[d]**	**rho[c]**	**$^{207}Pb/^{206}Pb$[e]**	**2 σ[d]**	**$^{207}Pb/^{235}U$**	**2 σ**	**$^{206}Pb/^{238}U$**	**2 σ**	**$^{207}Pb/^{206}Pb$**	**2 σ**	**%**		
204/28-1, 1941.55 m	Zircon_Sample_007	15	8	0.85	13.66	0.98	0.530	0.032	0.83	0.187	0.007	2727	195	2741	133	2716	64	101	x	x
204/28-1, 1941.55 m	Zircon_Sample_008	116	65	0.49	15.19	0.63	0.562	0.020	0.84	0.196	0.004	2827	118	2874	82	2793	36	103	x	
204/28-1, 1941.55 m	Zircon_Sample_009	14	7	0.53	12.99	0.90	0.508	0.029	0.83	0.185	0.007	2679	185	2649	125	2701	62	98	x	
204/28-1, 1941.55 m	Zircon_Sample_010	80	42	0.21	14.04	0.45	0.526	0.014	0.85	0.194	0.003	2753	89	2723	61	2775	28	98	x	
204/28-1, 1941.55 m	Zircon_Sample_011	110	53	0.11	12.95	0.39	0.487	0.013	0.85	0.193	0.003	2676	81	2557	55	2767	26	92	x	
204/28-1, 1941.55 m	Zircon_Sample_012	266	58	0.13	5.75	0.17	0.220	0.005	0.85	0.190	0.003	1939	57	1280	29	2741	25	47	x	
204/28-1, 1941.55 m	Zircon_Sample_013	188	90	0.11	12.86	0.36	0.482	0.012	0.86	0.194	0.003	2669	75	2534	50	2774	24	91	x	
204/28-1, 1941.55 m	Zircon_Sample_015	67	31	0.45	12.51	0.44	0.465	0.014	0.85	0.195	0.004	2644	92	2463	60	2785	30	88	x	
204/28-1, 1941.55 m	Zircon_Sample_020	82	47	0.02	15.12	0.55	0.579	0.018	0.85	0.190	0.004	2823	102	2944	72	2738	31	108	x	
204/28-1, 1941.55 m	Zircon_Sample_021	56	16	0.18	7.09	0.31	0.288	0.011	0.83	0.178	0.004	2122	94	1632	53	2638	41	62	x	
204/28-1, 1941.55 m	Zircon_Sample_022	22	12	0.66	14.37	0.89	0.539	0.028	0.84	0.193	0.007	2775	172	2779	117	2771	54	100	x	x
204/28-1, 1941.55 m	Zircon_Sample_023	132	52	0.31	10.26	0.31	0.396	0.010	0.85	0.188	0.003	2459	75	2152	47	2723	26	79	x	
204/28-1, 1941.55 m	Zircon_Sample_024	84	45	0.25	14.20	0.47	0.533	0.015	0.85	0.193	0.003	2763	92	2754	63	2770	28	99	x	
204/28-1, 1941.55 m	Zircon_Sample_025	110	58	0.17	13.52	0.55	0.529	0.018	0.84	0.185	0.004	2717	110	2738	76	2701	36	101	x	x
204/28-1, 1941.55 m	Zircon_Sample_026	158	53	0.10	8.13	0.33	0.332	0.011	0.83	0.177	0.004	2245	92	1849	55	2629	38	70	x	
204/28-1, 1941.55 m	Zircon_Sample_027	91	53	0.16	15.07	0.47	0.578	0.015	0.85	0.189	0.003	2820	88	2939	63	2736	27	107	x	
204/28-1, 1941.55 m	Zircon_Sample_033	19	10	0.25	13.66	0.70	0.516	0.022	0.84	0.192	0.005	2726	139	2681	94	2761	45	97	x	
204/28-1, 1941.55 m	Zircon_Sample_034	381	126	0.14	8.16	0.24	0.329	0.008	0.85	0.180	0.003	2249	66	1836	40	2649	25	69	x	
204/28-1, 1941.55 m	Zircon_Sample_035	186	99	0.14	14.08	0.40	0.533	0.013	0.85	0.192	0.003	2755	78	2753	54	2757	24	100	x	x
204/28-1, 1941.55 m	Zircon_Sample_036	323	113	0.11	8.87	0.28	0.349	0.009	0.85	0.184	0.003	2324	72	1929	44	2692	27	72	x	
204/28-1, 1941.55 m	Zircon_Sample_037	46	25	0.32	14.69	0.65	0.542	0.020	0.84	0.197	0.005	2796	124	2792	85	2798	39	100	x	x
204/28-1, 1941.55 m	Zircon_Sample_038	151	72	0.12	12.75	0.38	0.474	0.012	0.85	0.195	0.003	2662	79	2500	52	2787	25	90	x	
204/28-1, 1941.55 m	Zircon_Sample_039	119	66	0.13	15.09	0.63	0.553	0.020	0.84	0.198	0.004	2821	119	2839	81	2808	37	101	x	x
204/28-1, 1941.55 m	Zircon_Sample_041	147	64	0.13	11.22	0.34	0.436	0.011	0.85	0.187	0.003	2542	76	2335	50	2712	26	86	x	
204/28-1, 1941.55 m	Zircon_Sample_042	107	54	0.43	13.37	0.41	0.505	0.013	0.85	0.192	0.003	2706	83	2637	56	2758	26	96	x	
204/28-1, 1941.55 m	Zircon_Sample_046	184	64	0.12	8.75	0.28	0.349	0.009	0.84	0.182	0.003	2312	74	1930	45	2669	28	72	x	
204/28-1, 1941.55 m	Zircon_Sample_049	179	89	0.16	12.79	0.38	0.496	0.012	0.85	0.187	0.003	2665	79	2597	53	2716	25	96	x	
204/28-1, 1941.55 m	Zircon_Sample_050	137	53	0.10	10.16	0.32	0.390	0.010	0.84	0.189	0.003	2449	77	2124	48	2731	28	78	x	
204/28-1, 1941.55 m	Zircon_Sample_051	190	70	0.21	9.58	0.28	0.369	0.009	0.85	0.188	0.003	2395	71	2023	43	2729	26	74	x	
204/28-1, 1941.55 m	Zircon_Sample_055	144	78	0.11	14.65	0.44	0.545	0.014	0.85	0.195	0.003	2792	84	2802	58	2785	26	101	x	x
204/28-1, 1941.55 m	Zircon_Sample_059	161	64	0.21	10.40	0.32	0.397	0.010	0.84	0.190	0.003	2471	76	2157	48	2741	27	79	x	
204/28-1, 1941.55 m	Zircon_Sample_060	73	40	0.23	14.97	0.63	0.550	0.019	0.84	0.197	0.004	2813	118	2824	80	2805	37	101	x	x
204/28-1, 1941.55 m	Zircon_Sample_061	178	70	0.08	10.43	0.32	0.396	0.010	0.84	0.191	0.003	2474	75	2151	47	2751	26	78	x	
204/28-1, 1941.55 m	Zircon_Sample_062	105	45	0.07	11.45	0.37	0.428	0.012	0.84	0.194	0.003	2560	84	2298	53	2775	29	83	x	
204/28-1, 1941.55 m	Zircon_Sample_064	187	81	0.19	11.70	0.35	0.433	0.011	0.84	0.196	0.003	2581	78	2320	49	2793	26	83	x	
204/28-1, 1941.55 m	Zircon_Sample_065	153	79	0.16	13.53	0.41	0.516	0.013	0.84	0.190	0.003	2717	82	2683	56	2743	26	98	x	
204/28-1, 1941.55 m	Zircon_Sample_066	438	103	0.04	5.41	0.16	0.236	0.006	0.84	0.166	0.003	1886	55	1367	30	2519	26	54	x	
204/28-1, 1941.55 m	Zircon_Sample_067	123	55	0.21	11.95	0.38	0.450	0.012	0.84	0.193	0.003	2600	83	2394	54	2765	28	87	x	
204/28-1, 1941.55 m	Zircon_Sample_068	121	59	0.07	12.60	0.40	0.490	0.013	0.84	0.187	0.003	2650	84	2571	57	2712	28	95	x	
204/28-1, 1941.55 m	Zircon_Sample_072	17	9	1.16	12.64	0.73	0.491	0.024	0.83	0.187	0.006	2653	154	2576	102	2713	52	95	x	
204/28-1, 1941.55 m	Zircon_Sample_073	478	92	0.05	5.12	0.18	0.192	0.006	0.83	0.193	0.004	1839	64	1132	30	2771	31	41	x	
204/28-1, 1941.55 m	Zircon_Sample_074	78	43	0.28	14.95	0.53	0.549	0.016	0.84	0.197	0.004	2812	99	2822	68	2805	31	101	x	x
204/28-1, 1941.55 m	Zircon_Sample_075	206	94	0.12	12.07	0.36	0.455	0.011	0.84	0.192	0.003	2610	77	2418	50	2762	26	88	x	
204/28-1, 1941.55 m	Zircon_Sample_076	126	68	0.13	14.06	0.47	0.538	0.015	0.84	0.189	0.003	2754	92	2777	63	2737	30	101	x	
204/28-1, 1941.55 m	Zircon_Sample_078	180	87	0.19	12.78	0.39	0.485	0.012	0.84	0.191	0.003	2664	81	2548	54	2753	27	93	x	
204/28-1, 1941.55 m	Zircon_Sample_079	232	99	0.14	11.05	0.33	0.426	0.011	0.84	0.188	0.003	2527	75	2286	48	2727	26	84	x	
204/28-1, 1941.55 m	Zircon_Sample_081	145	75	0.12	13.39	0.42	0.519	0.014	0.84	0.187	0.003	2707	85	2695	58	2716	28	99	x	
204/28-1, 1941.55 m	Zircon_Sample_086	57	32	0.22	14.63	0.72	0.556	0.023	0.83	0.191	0.005	2791	137	2851	94	2748	44	104	x	
204/28-1, 1941.55 m	Zircon_Sample_087	72	40	0.18	14.98	0.68	0.549	0.021	0.83	0.198	0.005	2814	127	2820	86	2810	40	100	x	x
204/28-1, 1941.55 m	Zircon_Sample_088	9	4	0.62	10.62	0.91	0.412	0.029	0.83	0.187	0.009	2491	212	2222	132	2718	77	82	x	
204/28-1, 1941.55 m	Zircon_Sample_089	513	121	0.06	5.96	0.18	0.236	0.006	0.83	0.183	0.003	1969	58	1364	30	2683	27	51	x	
204/28-1, 1941.55 m	Zircon_Sample_091	425	103	0.32	6.05	0.18	0.241	0.006	0.83	0.182	0.003	1983	60	1394	32	2669	28	52	x	
204/28-1, 1941.55 m	Zircon_Sample_092	56	29	0.26	13.75	0.53	0.523	0.017	0.83	0.191	0.004	2733	105	2712	71	2748	34	99	x	
204/28-1, 1941.55 m	Zircon_Sample_093	252	103	0.08	10.29	0.31	0.407	0.010	0.83	0.183	0.003	2461	75	2201	47	2683	28	82	x	
204/28-1, 1941.55 m	Zircon_Sample_094	94	48	0.13	13.14	0.44	0.509	0.014	0.83	0.187	0.004	2690	91	2653	61	2717	31	98	x	
204/28-1, 1941.55 m	Zircon_Sample_098	137	58	0.21	11.05	0.36	0.424	0.012	0.83	0.189	0.003	2527	83	2280	52	2732	30	83	x	
204/28-1, 1941.55 m	Zircon_Sample_099	395	141	0.28	9.36	0.28	0.356	0.009	0.83	0.191	0.003	2374	72	1964	43	2747	28	72	x	
204/28-1, 1941.55 m	Zircon_Sample_100	211	83	0.11	10.45	0.33	0.394	0.010	0.83	0.192	0.003	2476	79	2141	48	2763	29	77	x	
204/28-1, 1941.55 m	Zircon_Sample_101	225	92	0.14	11.04	0.35	0.410	0.011	0.83	0.196	0.003	2527	79	2213	49	2789	28	79	x	
204/28-1, 1941.55 m	Zircon_Sample_102	111	55	0.09	13.25	0.45	0.493	0.014	0.83	0.195	0.004	2697	92	2585	60	2783	31	93	x	
204/28-1, 1941.55 m	Zircon_Sample_103	100	53	0.39	14.36	0.49	0.534	0.015	0.83	0.195	0.004	2774	95	2756	64	2787	31	99	x	x

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using $(^{207}Pb/^{206}Pb)/(^{238}U/^{206}Pb * 1/137.88)$

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

					RATIOS							AGES [Ma]						Conc.	use for UI age
Sample	Analysis	U [ppm][a]	Pb [ppm][a]	Th/U[a]	$^{207}Pb/^{235}U$[b]	2 σ[d]	$^{206}Pb/^{238}U$[b]	2 σ[d]	rho[c]	$^{207}Pb/^{206}Pb$[e]	2 σ[d]	$^{207}Pb/^{235}U$	2 σ	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	%	
205/20-1, 2017.50 m	Zircon_Sample_046	771	249	0.74	7.64	0.41	0.323	0.017	0.97	0.172	0.002	2190	117	1803	81	2574	22	70	x
205/20-1, 2017.50 m	Zircon_Sample_048	191	102	0.80	13.93	0.76	0.533	0.028	0.96	0.189	0.003	2745	149	2754	117	2738	24	101	x
205/20-1, 2017.50 m	Zircon_Sample_049	512	220	0.70	10.82	0.58	0.429	0.022	0.97	0.183	0.002	2508	134	2300	100	2680	22	86	x
205/20-1, 2017.50 m	Zircon_Sample_050	83	44	0.89	13.81	0.79	0.529	0.029	0.95	0.189	0.003	2737	157	2737	121	2737	30	100	x
205/20-1, 2017.50 m	Zircon_Sample_051	420	203	0.53	12.54	0.68	0.484	0.025	0.96	0.188	0.003	2645	144	2547	110	2722	24	94	x
205/20-1, 2017.50 m	Zircon_Sample_052	611	255	0.55	10.48	0.56	0.417	0.022	0.97	0.182	0.002	2478	133	2245	98	2675	22	84	x
205/20-1, 2017.50 m	Zircon_Sample_053	589	244	0.53	10.42	0.56	0.414	0.021	0.97	0.182	0.003	2472	133	2235	98	2674	23	84	x
205/20-1, 2017.50 m	Zircon_Sample_054	348	175	0.31	12.91	0.69	0.503	0.026	0.96	0.186	0.003	2673	144	2625	112	2709	23	97	x
205/20-1, 2017.50 m	Zircon_Sample_055	198	102	0.61	13.30	0.76	0.515	0.028	0.95	0.187	0.003	2701	154	2680	119	2717	30	99	x
205/20-1, 2017.50 m	Zircon_Sample_059	153	81	0.73	14.03	0.77	0.531	0.028	0.96	0.192	0.003	2752	151	2745	118	2757	26	100	x
205/20-1, 2017.50 m	Zircon_Sample_060	116	62	0.59	13.85	0.77	0.533	0.028	0.96	0.188	0.003	2739	152	2755	119	2728	27	101	x
205/20-1, 2017.50 m	Zircon_Sample_061	345	155	0.51	11.31	0.62	0.450	0.024	0.96	0.182	0.003	2549	139	2394	104	2676	25	89	x
205/20-1, 2017.50 m	Zircon_Sample_062	137	72	0.44	13.62	0.75	0.528	0.028	0.96	0.187	0.003	2724	150	2734	118	2716	26	101	x
205/20-1, 2017.50 m	Zircon_Sample_063	37	20	2.00	13.67	0.84	0.526	0.030	0.93	0.189	0.004	2727	167	2724	127	2729	37	100	x
205/20-1, 2017.50 m	Zircon_Sample_064	121	64	0.67	13.57	0.77	0.529	0.028	0.95	0.186	0.003	2720	154	2735	120	2709	29	101	x
205/20-1, 2017.50 m	Zircon_Sample_065	518	223	0.50	10.81	0.58	0.430	0.022	0.96	0.182	0.003	2507	136	2306	101	2674	25	86	x
205/20-1, 2017.50 m	Zircon_Sample_066	210	103	0.40	12.70	0.70	0.490	0.026	0.96	0.188	0.003	2658	146	2573	111	2723	26	94	x
205/20-1, 2017.50 m	Zircon_Sample_067	874	274	0.27	7.31	0.40	0.314	0.016	0.96	0.169	0.003	2150	116	1759	80	2549	25	69	x
205/20-1, 2017.50 m	Zircon_Sample_068	771	241	0.38	7.16	0.39	0.312	0.016	0.96	0.166	0.003	2132	116	1752	80	2521	26	69	x
205/20-1, 2017.50 m	Zircon_Sample_072	256	135	1.09	13.82	0.76	0.529	0.028	0.95	0.190	0.003	2738	151	2737	117	2738	27	100	x
205/20-1, 2017.50 m	Zircon_Sample_073	41	21	1.47	13.16	0.79	0.504	0.028	0.93	0.189	0.004	2691	162	2633	121	2735	36	96	x
205/20-1, 2017.50 m	Zircon_Sample_074	624	240	1.07	9.48	0.52	0.385	0.020	0.95	0.179	0.003	2385	130	2099	93	2639	27	80	x
205/20-1, 2017.50 m	Zircon_Sample_075	159	73	0.68	11.60	0.65	0.457	0.024	0.95	0.184	0.003	2573	144	2428	107	2688	29	90	x
205/20-1, 2017.50 m	Zircon_Sample_076	493	204	0.51	10.59	0.58	0.413	0.022	0.95	0.186	0.003	2488	137	2229	99	2706	27	82	x

[a] U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b] Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using $(^{207}Pb/^{206}Pb)/(^{238}U/^{206}Pb * 1/137.88)$

[c] Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d] Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e] Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

					RATIOS							AGES [Ma]						Conc.	use for conc age
Sample	**Analysis**	**U [ppm][a]**	**Pb [ppm][a]**	**Th/U[a]**	**$^{207}Pb/^{235}U$[b]**	**2 σ[d]**	**$^{206}Pb/^{238}U$[b]**	**2 σ[d]**	**rho[c]**	**$^{207}Pb/^{206}Pb$[e]**	**2 σ[d]**	**$^{207}Pb/^{235}U$**	**2 σ**	**$^{206}Pb/^{238}U$**	**2 σ**	**$^{207}Pb/^{206}Pb$**	**2 σ**	%	
206/7a-2, 2141.40 m	Zircon_Sample_046	646	373	0.05	15.71	0.72	0.578	0.025	0.95	0.197	0.005	2859	131	2940	103	2803	45	105	
206/7a-2, 2141.40 m	Zircon_Sample_047	431	208	0.08	12.49	0.57	0.483	0.021	0.95	0.187	0.005	2642	121	2542	92	2720	46	93	
206/7a-2, 2141.40 m	Zircon_Sample_048	40	22	1.26	14.93	0.82	0.546	0.027	0.91	0.198	0.009	2811	154	2808	114	2813	72	100	x
206/7a-2, 2141.40 m	Zircon_Sample_049	791	280	0.06	9.58	0.44	0.354	0.016	0.95	0.197	0.006	2396	110	1952	74	2798	46	70	
206/7a-2, 2141.40 m	Zircon_Sample_050	528	249	0.06	12.80	0.59	0.471	0.021	0.95	0.197	0.006	2665	123	2489	90	2801	47	89	
206/7a-2, 2141.40 m	Zircon_Sample_051	533	290	0.05	14.73	0.68	0.544	0.024	0.95	0.196	0.006	2798	129	2799	99	2797	46	100	x
206/7a-2, 2141.40 m	Zircon_Sample_052	44	23	1.31	13.64	0.96	0.525	0.035	0.96	0.188	0.008	2725	192	2722	149	2728	67	100	
206/7a-2, 2141.40 m	Zircon_Sample_053	124	64	0.18	13.35	0.64	0.521	0.024	0.94	0.186	0.006	2705	130	2706	100	2705	53	100	
206/7a-2, 2141.40 m	Zircon_Sample_054	693	384	0.08	15.35	0.71	0.554	0.024	0.95	0.201	0.006	2837	131	2843	101	2833	45	100	x
206/7a-2, 2141.40 m	Zircon_Sample_055	999	415	0.10	11.26	0.52	0.416	0.018	0.95	0.196	0.006	2545	118	2242	83	2796	49	80	
206/7a-2, 2141.40 m	Zircon_Sample_059	18	10	2.39	13.93	0.97	0.530	0.034	0.91	0.191	0.011	2745	191	2742	142	2747	93	100	
206/7a-2, 2141.40 m	Zircon_Sample_060	947	313	0.05	8.51	0.40	0.331	0.015	0.94	0.187	0.006	2287	107	1843	71	2712	50	68	
206/7a-2, 2141.40 m	Zircon_Sample_061	773	417	0.05	14.56	0.69	0.539	0.024	0.95	0.196	0.006	2787	133	2779	102	2793	48	99	x
206/7a-2, 2141.40 m	Zircon_Sample_062	416	223	0.07	14.65	0.73	0.536	0.025	0.95	0.198	0.006	2793	139	2767	106	2811	49	98	x
206/7a-2, 2141.40 m	Zircon_Sample_063	441	240	0.04	14.90	0.71	0.545	0.024	0.94	0.198	0.006	2809	133	2804	102	2813	51	100	x
206/7a-2, 2141.40 m	Zircon_Sample_064	476	192	0.10	11.53	0.54	0.404	0.018	0.94	0.207	0.006	2567	121	2189	83	2881	50	76	
206/7a-2, 2141.40 m	Zircon_Sample_065	70	37	0.55	13.94	0.80	0.530	0.029	0.94	0.191	0.007	2746	158	2741	121	2750	63	100	
206/7a-2, 2141.40 m	Zircon_Sample_066	379	207	0.03	14.77	0.71	0.545	0.024	0.94	0.197	0.006	2801	134	2803	102	2798	53	100	x
206/7a-2, 2141.40 m	Zircon_Sample_067	399	208	0.12	14.74	0.70	0.523	0.023	0.94	0.204	0.007	2798	133	2710	99	2862	52	95	
206/7a-2, 2141.40 m	Zircon_Sample_068	312	154	0.13	13.74	0.66	0.494	0.022	0.94	0.202	0.007	2732	131	2589	96	2840	54	91	
206/7a-2, 2141.40 m	Zircon_Sample_072	23	12	1.63	14.00	0.87	0.531	0.029	0.89	0.191	0.011	2750	170	2747	123	2752	91	100	
206/7a-2, 2141.40 m	Zircon_Sample_073	350	190	0.06	14.67	0.73	0.543	0.025	0.93	0.196	0.007	2794	140	2795	105	2794	61	100	x
206/7a-2, 2141.40 m	Zircon_Sample_074	513	277	0.06	14.80	0.76	0.540	0.026	0.94	0.199	0.007	2803	144	2784	109	2816	56	99	x
206/7a-2, 2141.40 m	Zircon_Sample_075	424	230	0.06	14.63	0.72	0.541	0.025	0.93	0.196	0.007	2791	137	2789	104	2793	57	100	x
206/7a-2, 2141.40 m	Zircon_Sample_076	351	161	0.22	12.81	0.63	0.459	0.021	0.93	0.203	0.007	2666	131	2434	92	2847	58	85	

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using $(^{207}Pb/^{206}Pb)/(^{238}U/^{206}Pb * 1/137.88)$

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

					RATIOS							AGES [Ma]						Conc.	
Sample	**Analysis**	**U [ppm][a]**	**Pb [ppm][a]**	**Th/U[a]**	**^{207}Pb/^{235}U[b]**	**2 σ[d]**	**^{206}Pb/^{238}U[b]**	**2 σ[d]**	**rho[c]**	**^{207}Pb/^{206}Pb[e]**	**2 σ[d]**	**^{207}Pb/^{235}U**	**2 σ**	**^{206}Pb/^{238}U**	**2 σ**	**^{207}Pb/^{206}Pb**	**2 σ**	%	use for UI age
HM11694	Zircon_Sample_007	28	14	1.06	13.22	0.54	0.497	0.017	0.84	0.193	0.004	2695	111	2600	73	2767	36	94	
HM11694	Zircon_Sample_008	254	133	0.59	13.98	0.33	0.526	0.011	0.84	0.193	0.002	2748	66	2723	45	2767	21	98	x
HM11694	Zircon_Sample_009	860	317	0.12	9.85	0.22	0.368	0.007	0.84	0.194	0.002	2421	55	2020	33	2778	20	73	
HM11694	Zircon_Sample_012	672	292	0.26	11.98	0.27	0.434	0.008	0.85	0.200	0.002	2603	59	2324	37	2828	20	82	
HM11694	Zircon_Sample_014	462	248	0.16	14.24	0.32	0.535	0.010	0.85	0.193	0.002	2766	63	2764	43	2767	20	100	x
HM11694	Zircon_Sample_016	642	248	0.24	10.33	0.23	0.386	0.007	0.85	0.194	0.002	2465	56	2102	34	2780	20	76	
HM11694	Zircon_Sample_020	91	49	1.17	13.93	0.40	0.538	0.013	0.84	0.188	0.003	2745	78	2777	54	2722	25	102	x
HM11694	Zircon_Sample_022	55	16	1.00	7.70	0.29	0.295	0.009	0.83	0.189	0.004	2197	82	1669	45	2735	34	61	
HM11694	Zircon_Sample_024	79	42	1.05	14.00	0.43	0.531	0.014	0.84	0.191	0.003	2750	85	2748	58	2751	27	100	x
HM11694	Zircon_Sample_025	26	14	1.37	14.34	0.60	0.537	0.019	0.84	0.194	0.004	2773	116	2771	79	2774	37	100	x
HM11694	Zircon_Sample_026	92	50	1.28	14.46	0.43	0.542	0.014	0.84	0.193	0.003	2781	83	2793	57	2772	26	101	x
HM11694	Zircon_Sample_027	2693	305	0.12	3.15	0.07	0.113	0.002	0.84	0.202	0.002	1444	33	692	12	2839	20	24	
HM11694	Zircon_Sample_028	548	310	0.20	15.96	0.36	0.565	0.011	0.85	0.205	0.002	2874	65	2889	45	2865	20	101	
HM11694	Zircon_Sample_029	76	40	1.48	13.59	0.41	0.525	0.013	0.84	0.188	0.003	2722	82	2722	56	2722	27	100	x
HM11694	Zircon_Sample_036	117	57	1.02	12.56	0.36	0.487	0.012	0.84	0.187	0.003	2647	76	2559	51	2716	25	94	
HM11694	Zircon_Sample_037	19	10	1.47	13.45	0.64	0.522	0.021	0.83	0.187	0.005	2712	129	2709	88	2714	43	100	x
HM11694	Zircon_Sample_038	54	29	1.27	14.56	0.51	0.541	0.016	0.84	0.195	0.004	2787	97	2787	66	2786	31	100	x
HM11694	Zircon_Sample_039	185	98	0.44	13.92	0.37	0.531	0.012	0.84	0.190	0.003	2744	73	2744	50	2745	24	100	x
HM11694	Zircon_Sample_040	533	282	0.19	14.13	0.33	0.529	0.010	0.84	0.194	0.002	2758	64	2738	44	2773	20	99	x
HM11694	Zircon_Sample_042	434	209	0.23	12.75	0.30	0.481	0.010	0.84	0.192	0.002	2661	63	2532	42	2761	21	92	
HM11694	Zircon_Sample_046	45	24	1.65	13.83	0.49	0.530	0.016	0.84	0.189	0.004	2738	96	2740	66	2737	31	100	x
HM11694	Zircon_Sample_047	26	13	1.06	12.97	0.56	0.502	0.018	0.83	0.187	0.004	2677	116	2622	78	2720	39	96	
HM11694	Zircon_Sample_048	825	287	0.16	9.04	0.21	0.348	0.007	0.84	0.188	0.002	2342	55	1925	33	2729	21	71	
HM11694	Zircon_Sample_049	355	183	0.23	13.55	0.33	0.516	0.011	0.84	0.190	0.002	2719	66	2684	45	2745	21	98	x
HM11694	Zircon_Sample_050	60	32	1.36	13.91	0.47	0.532	0.015	0.84	0.189	0.003	2744	92	2752	63	2738	30	101	x
HM11694	Zircon_Sample_051	33	17	1.23	13.35	0.62	0.520	0.020	0.83	0.186	0.005	2705	126	2701	85	2708	42	100	x
HM11694	Zircon_Sample_052	33	16	1.35	12.79	0.61	0.498	0.020	0.83	0.186	0.005	2664	126	2605	85	2710	43	96	
HM11694	Zircon_Sample_053	28	15	1.41	13.60	0.70	0.528	0.023	0.83	0.187	0.005	2722	140	2731	95	2715	46	101	x
HM11694	Zircon_Sample_054	49	26	1.44	14.00	0.61	0.533	0.019	0.83	0.191	0.005	2750	119	2753	81	2747	39	100	x
HM11694	Zircon_Sample_055	618	303	0.16	12.86	0.30	0.490	0.010	0.84	0.190	0.002	2669	63	2570	42	2746	21	94	
HM11694	Zircon_Sample_059	47	25	2.02	13.59	0.48	0.533	0.016	0.83	0.185	0.004	2721	95	2752	65	2699	32	102	x
HM11694	Zircon_Sample_060	41	23	1.71	15.07	0.54	0.560	0.017	0.84	0.195	0.004	2820	102	2866	70	2787	32	103	
HM11694	Zircon_Sample_061	209	58	0.59	7.27	0.21	0.276	0.007	0.83	0.191	0.003	2145	61	1571	33	2751	26	57	
HM11694	Zircon_Sample_062	732	344	0.12	13.08	0.31	0.471	0.009	0.84	0.202	0.003	2686	64	2487	41	2839	21	88	
HM11694	Zircon_Sample_063	44	23	3.02	13.83	0.50	0.528	0.016	0.83	0.190	0.004	2738	98	2734	67	2741	32	100	x
HM11694	Zircon_Sample_064	59	24	0.64	10.34	0.36	0.408	0.012	0.83	0.184	0.004	2465	85	2206	54	2686	32	82	
HM11694	Zircon_Sample_065	817	339	0.07	12.80	0.31	0.415	0.008	0.84	0.224	0.003	2665	64	2238	38	3008	21	74	
HM11694	Zircon_Sample_066	32	17	1.83	13.51	0.53	0.525	0.017	0.83	0.187	0.004	2716	107	2721	73	2712	35	100	x
HM11694	Zircon_Sample_067	844	384	0.15	13.10	0.31	0.455	0.009	0.84	0.209	0.003	2687	65	2419	41	2894	21	84	
HM11694	Zircon_Sample_068	60	33	1.69	14.58	0.48	0.551	0.015	0.84	0.192	0.003	2789	92	2830	63	2758	29	103	
HM11694	Zircon_Sample_072	134	68	1.00	13.36	0.38	0.506	0.012	0.83	0.192	0.003	2705	77	2639	52	2756	26	96	
HM11694	Zircon_Sample_073	24	12	1.49	12.62	0.58	0.498	0.019	0.83	0.184	0.005	2651	121	2604	81	2688	41	97	
HM11694	Zircon_Sample_074	71	37	1.56	13.62	0.44	0.523	0.014	0.83	0.189	0.003	2723	87	2712	59	2732	29	99	x
HM11694	Zircon_Sample_075	53	27	1.57	13.10	0.46	0.500	0.015	0.83	0.190	0.004	2687	94	2615	62	2741	32	95	
HM11694	Zircon_Sample_076	551	309	0.17	16.56	0.41	0.561	0.012	0.84	0.214	0.003	2909	72	2869	48	2938	22	98	
HM11694	Zircon_Sample_077	95	49	0.86	13.69	0.42	0.512	0.013	0.83	0.194	0.003	2728	83	2665	55	2776	27	96	
HM11694	Zircon_Sample_078	684	298	0.22	13.36	0.33	0.436	0.009	0.83	0.222	0.003	2706	67	2332	40	2998	22	78	
HM11694	Zircon_Sample_079	19	9	0.85	13.59	0.68	0.489	0.020	0.83	0.202	0.006	2722	136	2567	89	2839	44	90	
HM11694	Zircon_Sample_080	21	11	1.52	14.36	0.88	0.538	0.028	0.83	0.194	0.007	2774	171	2774	116	2773	55	100	x
HM11694	Zircon_Sample_081	43	23	4.13	13.73	0.51	0.526	0.016	0.83	0.189	0.004	2731	101	2723	68	2737	33	99	
HM11694	Zircon_Sample_085	1442	316	0.09	5.81	0.15	0.219	0.005	0.83	0.192	0.003	1948	49	1279	24	2760	23	46	
HM11694	Zircon_Sample_086	42	22	2.97	13.69	0.56	0.521	0.018	0.83	0.191	0.004	2728	112	2702	75	2748	37	98	x
HM11694	Zircon_Sample_087	40	21	3.46	13.59	0.52	0.525	0.017	0.83	0.188	0.004	2721	104	2720	70	2722	35	100	x
HM11694	Zircon_Sample_088	158	61	0.72	9.98	0.29	0.385	0.009	0.83	0.188	0.003	2433	72	2099	44	2724	27	77	
HM11694	Zircon_Sample_089	61	31	1.78	13.30	0.46	0.509	0.014	0.83	0.190	0.004	2702	92	2651	62	2740	31	97	
HM11694	Zircon_Sample_090	44	22	2.50	13.28	0.52	0.492	0.016	0.83	0.196	0.004	2700	106	2579	69	2792	35	92	
HM11694	Zircon_Sample_091	38	20	3.50	13.53	0.57	0.517	0.018	0.83	0.190	0.004	2717	114	2688	76	2739	38	98	x
HM11694	Zircon_Sample_092	33	14	0.87	11.02	0.55	0.413	0.017	0.83	0.194	0.005	2525	126	2227	77	2775	45	80	
HM11694	Zircon_Sample_093	54	28	2.51	13.51	0.53	0.507	0.017	0.83	0.193	0.004	2716	107	2645	71	2769	36	96	
HM11694	Zircon_Sample_094	108	50	0.79	12.07	0.37	0.462	0.012	0.83	0.189	0.003	2610	81	2449	52	2736	28	90	
HM11694	Zircon_Sample_098	40	20	1.34	13.33	0.53	0.494	0.016	0.83	0.196	0.004	2703	108	2590	71	2789	36	93	

[a] U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b] Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); ^{207}Pb/^{235}U calculated using (^{207}Pb/^{206}Pb)/(^{238}U/^{206}Pb * 1/137.88)

[c] Rho is the error correlation defined as the quotient of the propagated errors of the ^{206}Pb/^{238}U and the ^{207}/^{235}U ratio

[d] Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e] Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

Sample	Analysis	U [ppm][a]	Pb [ppm][a]	Th/U[a]	RATIOS							AGES [Ma]						Conc.	use for UI age
					$^{207}Pb/^{235}U$[b]	2 σ[d]	$^{206}Pb/^{238}U$[b]	2 σ[d]	rho[c]	$^{207}Pb/^{206}Pb$[e]	2 σ[d]	$^{207}Pb/^{235}U$	2 σ	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	%	
208/23-1, 2071.26 m	Zircon_Sample_007	435	222	0.39	13.80	0.73	0.510	0.026	0.97	0.196	0.003	2736	145	2658	111	2795	22	95	x
208/23-1, 2071.26 m	Zircon_Sample_008	238	118	0.68	13.26	0.71	0.495	0.025	0.97	0.194	0.003	2699	144	2591	110	2780	23	93	x
208/23-1, 2071.26 m	Zircon_Sample_009	1292	203	0.57	4.08	0.22	0.157	0.008	0.97	0.189	0.003	1651	87	939	45	2732	22	34	x
208/23-1, 2071.26 m	Zircon_Sample_010	536	246	0.81	12.34	0.65	0.458	0.023	0.97	0.195	0.003	2630	138	2431	103	2787	21	87	x
208/23-1, 2071.26 m	Zircon_Sample_011	634	192	1.16	7.97	0.42	0.303	0.016	0.97	0.191	0.003	2228	118	1708	77	2748	22	62	x
208/23-1, 2071.26 m	Zircon_Sample_012	589	230	1.37	10.37	0.55	0.391	0.020	0.97	0.192	0.003	2468	130	2126	92	2764	21	77	x
208/23-1, 2071.26 m	Zircon_Sample_013	78	45	1.64	15.02	0.83	0.567	0.030	0.96	0.192	0.003	2816	155	2896	123	2760	26	105	x
208/23-1, 2071.26 m	Zircon_Sample_014	497	267	0.14	14.80	0.78	0.538	0.027	0.97	0.199	0.003	2802	148	2775	115	2822	21	98	x
208/23-1, 2071.26 m	Zircon_Sample_015	661	177	1.18	7.04	0.37	0.268	0.014	0.97	0.191	0.003	2117	112	1531	70	2747	22	56	x
208/23-1, 2071.26 m	Zircon_Sample_016	115	58	1.23	13.10	0.71	0.502	0.026	0.96	0.189	0.003	2687	147	2622	113	2736	26	96	x
208/23-1, 2071.26 m	Zircon_Sample_020	587	315	0.34	14.66	0.77	0.537	0.027	0.97	0.198	0.003	2794	148	2772	115	2809	22	99	x
208/23-1, 2071.26 m	Zircon_Sample_021	459	247	0.35	14.40	0.77	0.537	0.028	0.96	0.194	0.003	2776	148	2773	116	2779	23	100	x
208/23-1, 2071.26 m	Zircon_Sample_022	183	98	0.87	14.18	0.78	0.534	0.028	0.96	0.193	0.003	2762	151	2760	118	2764	26	100	x
208/23-1, 2071.26 m	Zircon_Sample_023	363	168	1.24	12.17	0.65	0.463	0.024	0.96	0.191	0.003	2618	139	2454	105	2748	23	89	x
208/23-1, 2071.26 m	Zircon_Sample_025	60	30	2.28	13.31	0.76	0.506	0.027	0.94	0.191	0.004	2702	154	2641	117	2747	30	96	x
208/23-1, 2071.26 m	Zircon_Sample_026	326	173	0.16	14.12	0.76	0.532	0.027	0.96	0.192	0.003	2758	148	2751	115	2762	24	100	x
208/23-1, 2071.26 m	Zircon_Sample_027	429	222	0.23	13.81	0.74	0.518	0.027	0.96	0.193	0.003	2737	146	2693	113	2770	24	97	x
208/23-1, 2071.26 m	Zircon_Sample_028	244	125	1.08	13.73	0.74	0.514	0.027	0.96	0.194	0.003	2731	147	2674	113	2774	25	96	x
208/23-1, 2071.26 m	Zircon_Sample_029	129	69	0.78	14.21	0.78	0.536	0.028	0.95	0.192	0.003	2764	153	2767	118	2762	27	100	x
208/23-1, 2071.26 m	Zircon_Sample_033	467	252	0.14	14.56	0.79	0.541	0.028	0.96	0.195	0.003	2787	152	2788	118	2786	26	100	x
208/23-1, 2071.26 m	Zircon_Sample_034	169	91	0.70	14.40	0.79	0.538	0.028	0.95	0.194	0.003	2777	152	2776	118	2777	27	100	x
208/23-1, 2071.26 m	Zircon_Sample_035	219	117	0.75	14.29	0.80	0.535	0.028	0.95	0.194	0.003	2769	154	2764	119	2774	29	100	x
208/23-1, 2071.26 m	Zircon_Sample_036	495	254	0.17	13.72	0.74	0.514	0.027	0.96	0.194	0.003	2731	147	2673	113	2774	26	96	x
208/23-1, 2071.26 m	Zircon_Sample_037	400	177	0.32	11.79	0.64	0.442	0.023	0.95	0.193	0.003	2588	140	2360	102	2772	26	85	x

[a] U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b] Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using $(^{207}Pb/^{206}Pb)/(^{238}U/^{206}Pb * 1/137.88)$

[c] Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d] Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e] Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

					RATIOS							AGES [Ma]						Conc.
Sample	Analysis	U [ppm][a]	Pb [ppm][a]	Th/U[a]	$^{207}Pb/^{235}U$[b]	2 σ[d]	$^{206}Pb/^{238}U$[b]	2 σ[d]	rho[c]	$^{207}Pb/^{206}Pb$[e]	2 σ[d]	$^{207}Pb/^{235}U$	2 σ	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	%
208/26-1, 3741.31 m	Zircon_Sample_046	29	16	0.20	14.80	1.05	0.545	0.037	0.94	0.197	0.005	2802	199	2805	152	2801	38	100
208/26-1, 3741.31 m	Zircon_Sample_047	14	8	0.58	13.63	0.98	0.527	0.030	0.79	0.188	0.008	2724	196	2728	126	2721	71	100
208/26-1, 3741.31 m	Zircon_Sample_048	30	16	0.57	13.71	0.81	0.526	0.029	0.92	0.189	0.004	2730	161	2726	121	2733	38	100
208/26-1, 3741.31 m	Zircon_Sample_049	14	7	0.28	13.83	1.11	0.527	0.039	0.91	0.190	0.006	2738	220	2729	163	2745	53	99
208/26-1, 3741.31 m	Zircon_Sample_050	11	6	0.27	13.84	1.24	0.528	0.043	0.91	0.190	0.007	2739	245	2734	181	2743	60	100
208/26-1, 3741.31 m	Zircon_Sample_051	68	37	0.22	14.78	0.92	0.544	0.032	0.96	0.197	0.003	2801	174	2798	135	2803	28	100
208/26-1, 3741.31 m	Zircon_Sample_052	13	7	0.49	14.48	1.30	0.543	0.044	0.90	0.193	0.008	2782	249	2797	183	2770	63	101
208/26-1, 3741.31 m	Zircon_Sample_053	121	63	0.19	13.64	0.71	0.525	0.026	0.95	0.188	0.003	2725	142	2721	110	2728	27	100
208/26-1, 3741.31 m	Zircon_Sample_054	181	96	0.11	13.97	0.89	0.534	0.033	0.97	0.190	0.003	2748	176	2758	139	2740	25	101
208/26-1, 3741.31 m	Zircon_Sample_059	10	5	0.40	13.60	1.23	0.526	0.043	0.91	0.188	0.007	2722	245	2724	182	2722	60	100
208/26-1, 3741.31 m	Zircon_Sample_061	105	58	0.20	15.51	0.81	0.555	0.027	0.95	0.203	0.003	2847	148	2847	114	2847	27	100
208/26-1, 3741.31 m	Zircon_Sample_062	79	44	0.34	15.74	0.89	0.559	0.030	0.95	0.204	0.004	2861	163	2864	125	2859	29	100
208/26-1, 3741.31 m	Zircon_Sample_063	41	21	0.27	13.68	0.85	0.526	0.031	0.94	0.189	0.004	2728	169	2725	129	2730	35	100
208/26-1, 3741.31 m	Zircon_Sample_064	138	76	0.43	15.14	0.84	0.548	0.029	0.95	0.200	0.003	2824	157	2819	121	2828	27	100
208/26-1, 3741.31 m	Zircon_Sample_065	65	36	0.45	15.19	1.04	0.555	0.036	0.96	0.199	0.004	2828	193	2845	151	2815	30	101
208/26-1, 3741.31 m	Zircon_Sample_066	58	31	0.63	13.56	0.74	0.526	0.027	0.93	0.187	0.004	2720	149	2727	114	2715	33	100
208/26-1, 3741.31 m	Zircon_Sample_067	145	80	0.45	14.98	0.77	0.549	0.027	0.94	0.198	0.003	2814	145	2823	111	2807	28	101
208/26-1, 3741.31 m	Zircon_Sample_068	56	31	0.25	15.49	0.92	0.555	0.031	0.93	0.203	0.004	2846	169	2845	128	2847	34	100
208/26-1, 3741.31 m	Zircon_Sample_072	363	198	0.03	14.81	0.76	0.545	0.026	0.94	0.197	0.004	2803	143	2803	109	2803	29	100
208/26-1, 3741.31 m	Zircon_Sample_073	65	36	0.46	14.92	0.88	0.549	0.030	0.94	0.197	0.004	2810	166	2821	127	2803	33	101
208/26-1, 3741.31 m	Zircon_Sample_074	181	99	0.12	14.71	0.80	0.545	0.028	0.94	0.196	0.004	2796	152	2805	116	2790	30	101
208/26-1, 3741.31 m	Zircon_Sample_075	96	52	0.23	14.84	0.79	0.545	0.027	0.93	0.198	0.004	2805	150	2804	113	2806	31	100
208/26-1, 3741.31 m	Zircon_Sample_076	106	59	0.24	15.44	0.94	0.555	0.032	0.95	0.202	0.004	2843	172	2847	132	2840	31	100

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using ($^{207}Pb/^{206}Pb$)/($^{238}U/^{206}Pb$ * 1/137.88)

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

					RATIOS							AGES [Ma]						Conc.	use for conc age
Sample	**Analysis**	**U [ppm][a]**	**Pb [ppm][a]**	**Th/U[a]**	**$^{207}Pb/^{235}U$[b]**	**2 σ[d]**	**$^{206}Pb/^{238}U$[b]**	**2 σ[d]**	**rho[c]**	**$^{207}Pb/^{206}Pb$[e]**	**2 σ[d]**	**$^{207}Pb/^{235}U$**	**2 σ**	**$^{206}Pb/^{238}U$**	**2 σ**	**$^{207}Pb/^{206}Pb$**	**2 σ**	%	
208/27-2, 1357.11 m	Zircon_Sample_007	64	34	0.35	14.20	0.52	0.537	0.017	0.84	0.192	0.004	2763	102	2769	70	2759	32	100	
208/27-2, 1357.11 m	Zircon_Sample_008	47	25	0.30	13.64	0.53	0.526	0.017	0.84	0.188	0.004	2725	107	2723	73	2726	34	100	
208/27-2, 1357.11 m	Zircon_Sample_009	366	198	0.33	14.66	0.40	0.542	0.013	0.86	0.196	0.003	2794	77	2792	53	2795	23	100	x
208/27-2, 1357.11 m	Zircon_Sample_010	62	33	0.22	13.92	0.50	0.530	0.016	0.84	0.191	0.004	2745	100	2740	68	2748	32	100	
208/27-2, 1357.11 m	Zircon_Sample_011	440	240	0.29	14.73	0.40	0.545	0.013	0.86	0.196	0.003	2798	75	2802	52	2794	23	100	x
208/27-2, 1357.11 m	Zircon_Sample_012	105	57	0.35	14.55	0.49	0.541	0.015	0.85	0.195	0.004	2786	94	2787	65	2785	29	100	x
208/27-2, 1357.11 m	Zircon_Sample_013	13	7	0.13	14.41	0.89	0.540	0.028	0.84	0.193	0.006	2777	171	2785	116	2771	54	101	x
208/27-2, 1357.11 m	Zircon_Sample_014	162	87	0.39	14.30	0.44	0.538	0.014	0.85	0.193	0.003	2770	85	2775	59	2766	26	100	x
208/27-2, 1357.11 m	Zircon_Sample_015	65	35	0.41	14.04	0.54	0.533	0.017	0.84	0.191	0.004	2753	106	2754	73	2752	34	100	
208/27-2, 1357.11 m	Zircon_Sample_020	41	22	0.41	14.48	0.63	0.540	0.020	0.84	0.195	0.005	2782	122	2782	83	2782	39	100	x
208/27-2, 1357.11 m	Zircon_Sample_021	1521	383	0.28	6.44	0.18	0.252	0.006	0.85	0.186	0.003	2037	57	1447	31	2703	24	54	
208/27-2, 1357.11 m	Zircon_Sample_022	44	24	0.33	14.74	0.62	0.544	0.019	0.84	0.197	0.004	2798	118	2798	80	2799	37	100	x
208/27-2, 1357.11 m	Zircon_Sample_023	286	156	0.30	14.84	0.44	0.546	0.014	0.85	0.197	0.003	2805	84	2808	58	2803	26	100	x
208/27-2, 1357.11 m	Zircon_Sample_024	70	37	0.34	13.80	0.57	0.532	0.018	0.84	0.188	0.004	2736	112	2749	77	2726	37	101	
208/27-2, 1357.11 m	Zircon_Sample_025	9	5	0.13	14.01	1.01	0.519	0.031	0.84	0.196	0.008	2751	199	2694	133	2792	64	97	
208/27-2, 1357.11 m	Zircon_Sample_026	70	37	0.33	13.70	0.52	0.528	0.017	0.84	0.188	0.004	2729	104	2732	71	2727	34	100	
208/27-2, 1357.11 m	Zircon_Sample_027	229	121	0.40	14.05	0.44	0.530	0.014	0.84	0.192	0.003	2753	87	2742	59	2761	28	99	x
208/27-2, 1357.11 m	Zircon_Sample_029	63	34	0.35	14.86	0.68	0.548	0.021	0.84	0.197	0.005	2806	128	2816	87	2799	41	101	x
208/27-2, 1357.11 m	Zircon_Sample_034	542	220	0.16	10.26	0.33	0.406	0.011	0.84	0.184	0.003	2459	78	2195	49	2685	29	82	
208/27-2, 1357.11 m	Zircon_Sample_035	620	333	0.41	14.65	0.48	0.537	0.015	0.83	0.198	0.004	2793	92	2771	62	2809	29	99	x
208/27-2, 1357.11 m	Zircon_Sample_036	276	150	0.32	14.78	0.49	0.544	0.015	0.83	0.197	0.004	2801	92	2799	62	2803	29	100	x

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using ($^{207}Pb/^{206}Pb$)/($^{238}U/^{206}Pb$ * 1/137.88)

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

					RATIOS							AGES [Ma]						Conc.	use for UI age
Sample	Analysis	U [ppm][a]	Pb [ppm][a]	Th/U[a]	$^{207}Pb/^{235}U$[b]	2 σ[d]	$^{206}Pb/^{238}U$[b]	2 σ[d]	rho[c]	$^{207}Pb/^{206}Pb$[e]	2 σ[d]	$^{207}Pb/^{235}U$	2 σ	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	%	
88/02, 13.00 m	Zircon_Sample_085	90	45	0.84	13.23	0.85	0.500	0.030	0.92	0.192	0.005	2696	173	2613	127	2759	41	95	x
88/02, 13.00 m	Zircon_Sample_086	305	145	0.67	11.98	0.65	0.474	0.025	0.96	0.183	0.003	2603	142	2502	108	2682	25	93	x
88/02, 13.00 m	Zircon_Sample_087	112	57	0.24	13.22	0.73	0.505	0.027	0.96	0.190	0.003	2696	148	2636	114	2740	26	96	x
88/02, 13.00 m	Zircon_Sample_088	299	143	0.80	11.95	0.64	0.478	0.025	0.96	0.181	0.003	2600	139	2519	108	2664	23	95	x
88/02, 13.00 m	Zircon_Sample_089	82	44	0.73	13.87	0.78	0.530	0.028	0.95	0.190	0.003	2741	154	2743	120	2739	29	100	x
88/02, 13.00 m	Zircon_Sample_090	406	207	0.56	13.11	0.70	0.509	0.026	0.97	0.187	0.003	2688	143	2654	112	2713	23	98	x
88/02, 13.00 m	Zircon_Sample_091	414	197	0.52	11.84	0.63	0.476	0.025	0.96	0.180	0.003	2592	138	2509	107	2657	23	94	x
88/02, 13.00 m	Zircon_Sample_092	789	307	0.42	8.69	0.46	0.389	0.020	0.97	0.162	0.002	2306	123	2118	93	2477	23	86	x
88/02, 13.00 m	Zircon_Sample_093	202	106	0.63	13.43	0.77	0.524	0.028	0.95	0.186	0.003	2711	155	2715	120	2707	30	100	x
88/02, 13.00 m	Zircon_Sample_094	77	40	0.58	13.56	0.76	0.514	0.027	0.95	0.191	0.003	2720	153	2673	117	2755	28	97	x
88/02, 13.00 m	Zircon_Sample_098	50	26	0.42	13.85	0.81	0.528	0.029	0.94	0.190	0.004	2739	161	2733	123	2744	33	100	x
88/02, 13.00 m	Zircon_Sample_099	157	78	0.76	12.52	0.75	0.497	0.028	0.93	0.183	0.004	2644	159	2600	120	2678	36	97	x
88/02, 13.00 m	Zircon_Sample_100	331	139	0.63	9.87	0.57	0.419	0.023	0.94	0.171	0.003	2423	139	2255	103	2568	31	88	x
88/02, 13.00 m	Zircon_Sample_101	227	93	0.48	9.60	0.53	0.407	0.021	0.96	0.171	0.003	2397	131	2202	98	2566	27	86	x
88/02, 13.00 m	Zircon_Sample_102	138	69	0.56	12.57	0.74	0.499	0.028	0.94	0.183	0.004	2648	156	2610	118	2677	33	97	x
88/02, 13.00 m	Zircon_Sample_103	439	201	0.42	11.22	0.61	0.458	0.024	0.96	0.178	0.003	2541	138	2431	105	2630	25	92	x
88/02, 13.00 m	Zircon_Sample_104	464	169	0.70	7.86	0.44	0.364	0.019	0.95	0.157	0.003	2215	125	2002	92	2419	30	83	x
88/02, 13.00 m	Zircon_Sample_105	522	197	0.51	8.29	0.45	0.378	0.020	0.96	0.159	0.003	2264	123	2068	92	2446	27	85	x
88/02, 13.00 m	Zircon_Sample_106	172	91	0.52	14.00	0.78	0.530	0.028	0.95	0.192	0.003	2750	153	2742	118	2755	28	100	x
88/02, 13.00 m	Zircon_Sample_107	842	287	0.43	6.88	0.38	0.341	0.018	0.95	0.146	0.002	2096	115	1892	86	2303	28	82	x
88/02, 13.00 m	Zircon_Sample_111	302	108	0.19	7.90	0.45	0.359	0.019	0.94	0.159	0.003	2219	126	1979	91	2449	32	81	x
88/02, 13.00 m	Zircon_Sample_112	142	73	0.23	13.64	0.78	0.517	0.028	0.94	0.191	0.004	2725	155	2686	118	2755	31	98	x
88/02, 13.00 m	Zircon_Sample_113	344	167	0.43	12.06	0.67	0.485	0.026	0.95	0.180	0.003	2609	145	2548	111	2657	29	96	x
88/02, 13.00 m	Zircon_Sample_114	337	134	0.46	9.21	0.53	0.398	0.022	0.94	0.168	0.003	2359	137	2159	100	2537	34	85	x
88/02, 13.00 m	Zircon_Sample_115	465	191	0.64	9.81	0.56	0.411	0.022	0.94	0.173	0.003	2417	138	2219	101	2588	32	86	x

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using ($^{207}Pb/^{206}Pb$)/($^{238}U/^{206}Pb$ * 1/137.88)

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

					RATIOS							AGES [Ma]						Conc.	use for conc age
Sample	Analysis	U [ppm][a]	Pb [ppm][a]	Th/U[a]	$^{207}Pb/^{235}U$[b]	2 σ[d]	$^{206}Pb/^{238}U$[b]	2 σ[d]	rho[c]	$^{207}Pb/^{206}Pb$[e]	2 σ[d]	$^{207}Pb/^{235}U$	2 σ	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	%	
59-04/85DM	Zircon_Sample_046	623	277	0.07	11.28	0.54	0.444	0.020	0.94	0.184	0.003	2547	123	2371	90	2690	27	88	
59-04/85DM	Zircon_Sample_047	411	205	0.21	12.16	0.59	0.499	0.023	0.95	0.177	0.003	2617	127	2610	99	2621	26	100	
59-04/85DM	Zircon_Sample_048	113	61	0.61	13.90	0.68	0.534	0.024	0.93	0.189	0.003	2743	135	2756	102	2733	30	101	x
59-04/85DM	Zircon_Sample_049	167	88	0.27	13.95	0.68	0.526	0.024	0.94	0.192	0.003	2746	133	2723	102	2764	26	99	x
59-04/85DM	Zircon_Sample_050	125	66	0.05	13.64	0.68	0.527	0.024	0.93	0.188	0.004	2725	136	2727	103	2724	31	100	x
59-04/85DM	Zircon_Sample_051	143	76	0.27	14.02	0.70	0.532	0.025	0.94	0.191	0.003	2751	138	2751	106	2751	28	100	x
59-04/85DM	Zircon_Sample_052	520	275	0.23	14.02	0.68	0.529	0.024	0.94	0.192	0.003	2751	133	2739	102	2761	26	99	x
59-04/85DM	Zircon_Sample_053	177	95	0.35	14.05	0.69	0.536	0.025	0.94	0.190	0.003	2753	135	2765	104	2745	26	101	x
59-04/85DM	Zircon_Sample_054	415	222	0.32	14.04	0.67	0.533	0.024	0.95	0.191	0.003	2753	132	2756	102	2751	25	100	x
59-04/85DM	Zircon_Sample_055	617	325	0.15	13.92	0.67	0.527	0.024	0.95	0.191	0.003	2744	132	2731	101	2754	25	99	x
59-04/85DM	Zircon_Sample_059	177	66	0.21	9.90	0.49	0.375	0.017	0.93	0.192	0.003	2425	120	2051	81	2757	29	74	
59-04/85DM	Zircon_Sample_060	173	77	0.12	11.83	0.59	0.446	0.021	0.93	0.192	0.004	2591	129	2379	92	2761	30	86	
59-04/85DM	Zircon_Sample_061	122	65	0.28	13.86	0.71	0.534	0.025	0.90	0.188	0.004	2740	140	2759	103	2727	37	101	x
59-04/85DM	Zircon_Sample_062	547	288	0.15	13.83	0.69	0.527	0.025	0.93	0.190	0.004	2738	137	2731	104	2744	30	100	x
59-04/85DM	Zircon_Sample_063	195	107	0.19	15.15	0.75	0.549	0.026	0.94	0.200	0.004	2825	141	2821	106	2828	28	100	
59-04/85DM	Zircon_Sample_064	176	94	0.46	13.98	0.69	0.532	0.025	0.93	0.191	0.003	2748	136	2749	104	2748	29	100	x
59-04/85DM	Zircon_Sample_065	245	124	0.73	12.97	0.64	0.505	0.023	0.94	0.186	0.003	2677	131	2636	100	2708	28	97	
59-04/85DM	Zircon_Sample_066	265	132	0.42	12.23	0.60	0.500	0.023	0.94	0.177	0.003	2622	129	2614	99	2628	28	99	
59-04/85DM	Zircon_Sample_067	158	84	0.35	13.85	0.74	0.529	0.026	0.92	0.190	0.004	2739	146	2738	110	2740	33	100	x
59-04/85DM	Zircon_Sample_068	516	282	0.51	15.71	0.77	0.547	0.025	0.94	0.208	0.004	2859	139	2813	104	2892	27	97	
59-04/85DM	Zircon_Sample_072	53	29	0.55	13.99	0.76	0.534	0.026	0.90	0.190	0.004	2749	149	2760	110	2742	38	101	x
59-04/85DM	Zircon_Sample_073	70	37	0.70	13.73	0.73	0.530	0.025	0.88	0.188	0.005	2731	145	2741	105	2724	40	101	x
59-04/85DM	Zircon_Sample_074	261	136	0.11	13.43	0.69	0.522	0.024	0.91	0.186	0.004	2710	138	2709	103	2711	35	100	
59-04/85DM	Zircon_Sample_075	680	363	0.05	14.11	0.71	0.534	0.025	0.92	0.191	0.004	2757	139	2760	104	2755	32	100	x
59-04/85DM	Zircon_Sample_076	563	299	0.17	14.20	0.73	0.531	0.025	0.92	0.194	0.004	2763	141	2748	105	2775	33	99	x

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using $(^{207}Pb/^{206}Pb)/(^{238}U/^{206}Pb * 1/137.88)$

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

					RATIOS							AGES [Ma]						Conc.	use for conc age
Sample	Analysis	U [ppm][a]	Pb [ppm][a]	Th/U[a]	$^{207}Pb/^{235}U$[b]	2 σ[d]	$^{206}Pb/^{238}U$[b]	2 σ[d]	rho[c]	$^{207}Pb/^{206}Pb$[e]	2 σ[d]	$^{207}Pb/^{235}U$	2 σ	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	%	
59-04/186DM	Zircon_Sample_007	47	26	0.27	15.06	0.44	0.548	0.012	0.75	0.199	0.008	2819	82	2815	49	2822	61	100	x
59-04/186DM	Zircon_Sample_008	167	92	0.22	15.20	0.30	0.549	0.009	0.83	0.201	0.004	2828	57	2820	38	2833	36	100	x
59-04/186DM	Zircon_Sample_009	108	57	0.19	14.07	0.32	0.527	0.009	0.72	0.194	0.006	2754	63	2729	36	2773	51	98	
59-04/186DM	Zircon_Sample_010	85	41	0.49	13.34	0.33	0.488	0.008	0.66	0.198	0.007	2704	67	2561	35	2814	60	91	
59-04/186DM	Zircon_Sample_011	77	43	0.19	15.23	0.47	0.552	0.015	0.88	0.200	0.006	2830	88	2835	63	2826	48	100	x
59-04/186DM	Zircon_Sample_012	194	107	0.06	15.13	0.29	0.551	0.009	0.81	0.199	0.004	2823	55	2828	36	2820	36	100	x
59-04/186DM	Zircon_Sample_013	201	110	0.09	15.07	0.31	0.549	0.009	0.80	0.199	0.005	2820	58	2821	38	2819	40	100	x
59-04/186DM	Zircon_Sample_014	165	90	0.12	15.07	0.30	0.545	0.009	0.82	0.200	0.005	2819	55	2805	36	2830	37	99	x
59-04/186DM	Zircon_Sample_015	196	107	0.22	15.00	0.31	0.547	0.009	0.84	0.199	0.004	2815	58	2814	39	2816	36	100	x
59-04/186DM	Zircon_Sample_016	175	86	0.11	13.43	0.30	0.491	0.008	0.71	0.198	0.006	2711	61	2577	34	2812	51	92	
59-04/186DM	Zircon_Sample_020	63	35	0.19	15.58	0.49	0.556	0.015	0.86	0.203	0.006	2851	89	2851	62	2851	50	100	x
59-04/186DM	Zircon_Sample_024	61	35	0.35	15.79	0.69	0.574	0.024	0.94	0.199	0.006	2864	126	2926	97	2821	50	104	
59-04/186DM	Zircon_Sample_025	42	23	0.27	15.37	0.74	0.556	0.025	0.92	0.201	0.007	2838	136	2848	102	2831	59	101	x
59-04/186DM	Zircon_Sample_028	41	24	0.25	16.24	0.65	0.580	0.020	0.88	0.203	0.008	2891	115	2947	83	2852	60	103	
59-04/186DM	Zircon_Sample_033	56	32	0.33	15.89	0.67	0.574	0.022	0.90	0.201	0.007	2870	120	2926	88	2831	59	103	
59-04/186DM	Zircon_Sample_034	39	21	0.30	15.03	0.52	0.549	0.016	0.83	0.199	0.008	2817	98	2819	66	2816	61	100	x
59-04/186DM	Zircon_Sample_035	113	62	0.38	15.39	0.42	0.550	0.013	0.83	0.203	0.006	2839	78	2825	52	2849	50	99	x
59-04/186DM	Zircon_Sample_036	42	23	0.35	15.35	0.50	0.550	0.015	0.82	0.202	0.008	2837	93	2824	62	2846	59	99	x
59-04/186DM	Zircon_Sample_037	84	46	0.26	15.03	0.38	0.550	0.012	0.82	0.198	0.006	2817	72	2823	48	2812	46	100	x
59-04/186DM	Zircon_Sample_038	60	33	0.24	15.12	0.53	0.551	0.017	0.88	0.199	0.007	2823	99	2830	71	2818	54	100	x
59-04/186DM	Zircon_Sample_039	184	95	0.02	13.04	0.28	0.516	0.009	0.83	0.183	0.004	2682	58	2684	39	2681	39	100	
59-04/186DM	Zircon_Sample_040	129	70	0.20	15.05	0.38	0.547	0.012	0.86	0.199	0.005	2819	72	2815	50	2821	41	100	x
59-04/186DM	Zircon_Sample_041	93	51	0.43	15.22	0.41	0.552	0.012	0.81	0.200	0.006	2829	76	2833	50	2826	50	100	x
59-04/186DM	Zircon_Sample_042	46	25	0.26	15.21	0.48	0.551	0.014	0.84	0.200	0.007	2828	88	2830	60	2827	55	100	x
59-04/186DM	Zircon_Sample_046	41	23	0.27	15.45	0.60	0.556	0.019	0.89	0.202	0.007	2843	111	2849	80	2839	56	100	x
59-04/186DM	Zircon_Sample_048	82	45	0.22	15.23	0.66	0.553	0.021	0.88	0.200	0.008	2830	123	2837	87	2824	67	100	x
59-04/186DM	Zircon_Sample_050	92	52	0.35	15.62	0.54	0.565	0.018	0.91	0.201	0.006	2854	98	2886	73	2832	45	102	
59-04/186DM	Zircon_Sample_052	30	17	0.37	15.54	1.05	0.561	0.036	0.96	0.201	0.008	2849	193	2871	150	2833	62	101	x
59-04/186DM	Zircon_Sample_053	44	24	0.28	15.10	0.53	0.551	0.015	0.77	0.199	0.009	2822	100	2829	63	2817	72	100	x
59-04/186DM	Zircon_Sample_054	33	18	0.39	15.23	0.59	0.552	0.018	0.83	0.200	0.009	2830	110	2832	74	2828	68	100	x
59-04/186DM	Zircon_Sample_064	45	25	0.28	15.10	0.56	0.551	0.018	0.87	0.199	0.007	2822	105	2831	74	2816	59	101	x
59-04/186DM	Zircon_Sample_065	17	9	0.25	14.60	0.84	0.543	0.028	0.89	0.195	0.010	2790	160	2795	116	2786	82	100	x
59-04/186DM	Zircon_Sample_072	75	43	0.10	15.75	0.49	0.576	0.015	0.81	0.198	0.007	2862	90	2932	60	2813	58	104	
59-04/186DM	Zircon_Sample_073	32	18	0.37	15.24	0.79	0.551	0.026	0.91	0.201	0.009	2830	147	2830	108	2830	69	100	x
59-04/186DM	Zircon_Sample_074	60	33	0.18	15.24	0.78	0.551	0.025	0.89	0.201	0.009	2830	145	2828	104	2832	75	100	x
59-04/186DM	Zircon_Sample_075	51	28	0.43	14.97	0.58	0.547	0.018	0.87	0.198	0.008	2813	109	2814	77	2813	61	100	x
59-04/186DM	Zircon_Sample_076	23	13	0.32	15.71	0.83	0.575	0.025	0.83	0.198	0.012	2859	151	2929	103	2811	94	104	

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using ($^{207}Pb/^{206}Pb$)/($^{238}U/^{206}Pb$ * 1/137.88)

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

Sample	Analysis	U [ppm][a]	Pb [ppm][a]	Th/U[a]	RATIOS $^{207}Pb/^{235}U$[b]	2σ[d]	$^{206}Pb/^{238}U$[b]	2σ[d]	rho[c]	$^{207}Pb/^{206}Pb$[e]	2σ[d]	AGES [Ma] $^{207}Pb/^{235}U$	2σ	$^{206}Pb/^{238}U$	2σ	$^{207}Pb/^{206}Pb$	2σ	Conc. %	use for UI age
206/12-1, 1716.65 m	Zircon_Sample_276	218	115	0.40	13.86	0.35	0.527	0.012	0.91	0.191	0.004	2740	68	2730	51	2748	34	99	x
206/12-1, 1716.65 m	Zircon_Sample_277	227	120	0.36	13.76	0.34	0.530	0.012	0.91	0.188	0.004	2733	68	2742	51	2727	34	101	x
206/12-1, 1716.65 m	Zircon_Sample_278	255	104	0.36	10.36	0.26	0.406	0.009	0.91	0.185	0.004	2468	62	2195	42	2701	34	81	x
206/12-1, 1716.65 m	Zircon_Sample_279	401	199	0.62	12.76	0.32	0.496	0.011	0.91	0.187	0.004	2662	66	2595	49	2714	34	96	x
206/12-1, 1716.65 m	Zircon_Sample_280	260	103	0.53	10.19	0.25	0.396	0.009	0.91	0.187	0.004	2452	61	2148	42	2714	34	79	x
206/12-1, 1716.65 m	Zircon_Sample_281	387	143	0.50	9.49	0.24	0.370	0.008	0.91	0.186	0.004	2387	60	2029	40	2708	33	75	x
206/12-1, 1716.65 m	Zircon_Sample_282	229	117	0.90	13.11	0.33	0.510	0.012	0.91	0.187	0.004	2688	67	2656	50	2712	34	98	x
206/12-1, 1716.65 m	Zircon_Sample_283	525	118	0.54	5.58	0.14	0.224	0.005	0.91	0.181	0.004	1914	48	1304	27	2658	34	49	x
206/12-1, 1716.65 m	Zircon_Sample_284	440	166	0.52	9.74	0.24	0.378	0.009	0.91	0.187	0.004	2410	60	2065	40	2717	33	76	x
206/12-1, 1716.65 m	Zircon_Sample_285	306	120	0.55	10.13	0.25	0.392	0.009	0.91	0.188	0.004	2447	61	2130	41	2721	33	78	x
206/12-1, 1716.65 m	Zircon_Sample_286	333	100	0.33	8.03	0.20	0.299	0.007	0.91	0.195	0.004	2235	56	1686	34	2784	34	61	x
206/12-1, 1716.65 m	Zircon_Sample_287	297	158	0.65	13.88	0.35	0.530	0.012	0.91	0.190	0.004	2742	69	2741	51	2742	33	100	x
206/12-1, 1716.65 m	Zircon_Sample_288	58	31	0.68	13.90	0.35	0.529	0.012	0.91	0.191	0.004	2743	69	2738	51	2747	34	100	x
206/12-1, 1716.65 m	Zircon_Sample_289	20	11	0.71	13.76	0.36	0.528	0.012	0.90	0.189	0.004	2733	71	2734	52	2733	38	100	x
206/12-1, 1716.65 m	Zircon_Sample_290	59	31	1.50	13.68	0.35	0.525	0.012	0.91	0.189	0.004	2728	69	2719	51	2735	35	99	x
206/12-1, 1716.65 m	Zircon_Sample_293	155	81	0.26	13.75	0.34	0.524	0.012	0.91	0.190	0.004	2732	69	2718	51	2743	34	99	x
206/12-1, 1716.65 m	Zircon_Sample_294	166	90	0.67	14.25	0.36	0.539	0.012	0.91	0.192	0.004	2766	69	2781	52	2756	34	101	x
206/12-1, 1716.65 m	Zircon_Sample_295	121	64	1.49	13.78	0.35	0.527	0.012	0.91	0.190	0.004	2735	69	2728	51	2740	34	100	x
206/12-1, 1716.65 m	Zircon_Sample_296	407	175	0.71	11.24	0.28	0.429	0.010	0.91	0.190	0.004	2543	64	2301	44	2743	33	84	x
206/12-1, 1716.65 m	Zircon_Sample_297	263	115	0.58	11.30	0.28	0.437	0.010	0.91	0.188	0.004	2548	64	2336	45	2721	33	86	x
206/12-1, 1716.65 m	Zircon_Sample_298	211	93	0.53	11.64	0.29	0.440	0.010	0.91	0.192	0.004	2576	65	2352	45	2758	33	85	x
206/12-1, 1716.65 m	Zircon_Sample_299	267	141	1.07	14.00	0.35	0.530	0.012	0.91	0.192	0.004	2749	69	2741	51	2756	33	99	x
206/12-1, 1716.65 m	Zircon_Sample_300	48	25	1.35	13.24	0.34	0.511	0.012	0.91	0.188	0.004	2697	68	2663	50	2723	35	98	x
206/12-1, 1716.65 m	Zircon_Sample_301	211	112	0.61	14.04	0.35	0.530	0.012	0.91	0.192	0.004	2752	69	2742	51	2760	34	99	x
206/12-1, 1716.65 m	Zircon_Sample_302	170	75	0.63	11.49	0.29	0.442	0.010	0.91	0.189	0.004	2564	64	2359	45	2731	34	86	x
206/12-1, 1716.65 m	Zircon_Sample_303	517	171	0.67	8.42	0.21	0.331	0.008	0.91	0.184	0.004	2277	57	1846	37	2691	34	69	x
206/12-1, 1716.65 m	Zircon_Sample_304	18	10	1.76	14.86	0.39	0.546	0.013	0.90	0.197	0.004	2806	73	2808	53	2805	37	100	x
206/12-1, 1716.65 m	Zircon_Sample_305	24	13	2.97	15.08	0.39	0.546	0.013	0.90	0.200	0.004	2820	73	2809	53	2828	36	99	x
206/12-1, 1716.65 m	Zircon_Sample_306	249	132	0.44	13.89	0.35	0.531	0.012	0.91	0.190	0.004	2742	69	2745	51	2740	33	100	x
206/12-1, 1716.65 m	Zircon_Sample_307	371	173	0.38	12.01	0.30	0.466	0.011	0.91	0.187	0.004	2605	66	2468	47	2713	33	91	x
206/12-1, 1716.65 m	Zircon_Sample_310	139	73	0.34	13.74	0.35	0.526	0.012	0.91	0.189	0.004	2732	69	2726	51	2736	34	100	x
206/12-1, 1716.65 m	Zircon_Sample_311	343	112	0.30	8.33	0.21	0.326	0.008	0.91	0.185	0.004	2268	57	1818	36	2702	34	67	x
206/12-1, 1716.65 m	Zircon_Sample_312	174	87	0.42	13.09	0.33	0.502	0.012	0.91	0.189	0.004	2686	68	2622	50	2735	34	96	x
206/12-1, 1716.65 m	Zircon_Sample_313	244	90	0.50	9.53	0.24	0.368	0.008	0.91	0.188	0.004	2391	60	2021	40	2722	34	74	x
206/12-1, 1716.65 m	Zircon_Sample_314	820	162	0.58	4.99	0.13	0.197	0.005	0.91	0.183	0.004	1818	46	1162	24	2684	34	43	x
206/12-1, 1716.65 m	Zircon_Sample_315	385	201	0.79	13.63	0.34	0.523	0.012	0.91	0.189	0.004	2724	69	2713	51	2733	33	99	x
206/12-1, 1716.65 m	Zircon_Sample_316	135	72	0.71	14.16	0.36	0.533	0.012	0.91	0.193	0.004	2761	70	2755	52	2765	34	100	x
206/12-1, 1716.65 m	Zircon_Sample_317	31	15	0.82	13.18	0.34	0.488	0.011	0.91	0.196	0.004	2693	69	2560	49	2794	35	92	x
206/12-1, 1716.65 m	Zircon_Sample_318	32	17	0.82	13.61	0.35	0.524	0.012	0.91	0.188	0.004	2723	70	2717	52	2727	35	100	x
206/12-1, 1716.65 m	Zircon_Sample_319	38	21	0.96	14.94	0.38	0.546	0.013	0.91	0.198	0.004	2812	72	2809	53	2814	35	100	x
206/12-1, 1716.65 m	Zircon_Sample_320	122	58	0.66	13.18	0.34	0.478	0.011	0.91	0.200	0.004	2692	69	2521	49	2824	34	89	x
206/12-1, 1716.65 m	Zircon_Sample_321	180	95	0.37	13.99	0.35	0.530	0.012	0.91	0.192	0.004	2749	70	2739	52	2757	34	99	x
206/12-1, 1716.65 m	Zircon_Sample_322	101	54	0.36	14.07	0.36	0.532	0.012	0.91	0.192	0.004	2755	70	2750	52	2758	34	100	x
206/12-1, 1716.65 m	Zircon_Sample_323	90	28	1.01	8.13	0.21	0.312	0.007	0.91	0.189	0.004	2245	57	1753	36	2730	34	64	x
206/12-1, 1716.65 m	Zircon_Sample_324	25	11	1.20	12.32	0.33	0.453	0.011	0.89	0.197	0.005	2629	70	2408	48	2805	39	86	x
206/12-1, 1716.65 m	Zircon_Sample_327	547	165	0.34	7.76	0.20	0.301	0.007	0.91	0.187	0.004	2203	56	1698	35	2713	34	63	x
206/12-1, 1716.65 m	Zircon_Sample_328	346	182	0.71	13.65	0.35	0.527	0.012	0.91	0.188	0.004	2725	69	2727	52	2724	34	100	x
206/12-1, 1716.65 m	Zircon_Sample_329	152	81	0.41	13.89	0.35	0.529	0.012	0.91	0.190	0.004	2742	70	2736	52	2746	34	100	x
206/12-1, 1716.65 m	Zircon_Sample_330	329	96	0.91	7.51	0.19	0.291	0.007	0.91	0.187	0.004	2174	55	1649	34	2715	34	61	x
206/12-1, 1716.65 m	Zircon_Sample_331	180	96	0.50	13.99	0.36	0.530	0.012	0.91	0.192	0.004	2749	70	2741	52	2755	34	100	x
206/12-1, 1716.65 m	Zircon_Sample_332	36	20	1.52	14.64	0.41	0.542	0.013	0.88	0.196	0.005	2792	79	2791	56	2794	44	100	x
206/12-1, 1716.65 m	Zircon_Sample_333	238	126	0.75	13.90	0.35	0.528	0.012	0.91	0.191	0.004	2743	70	2734	52	2750	34	99	x
206/12-1, 1716.65 m	Zircon_Sample_334	214	111	1.06	13.18	0.34	0.516	0.012	0.91	0.185	0.004	2692	68	2683	51	2699	34	99	x
206/12-1, 1716.65 m	Zircon_Sample_335	86	46	0.55	13.85	0.35	0.532	0.012	0.91	0.189	0.004	2740	70	2749	52	2733	34	101	x
206/12-1, 1716.65 m	Zircon_Sample_336	316	152	0.68	12.40	0.31	0.482	0.011	0.91	0.187	0.004	2635	67	2535	49	2714	34	93	x
206/12-1, 1716.65 m	Zircon_Sample_337	332	79	0.49	6.21	0.16	0.239	0.006	0.91	0.189	0.004	2006	51	1379	29	2733	34	50	x
206/12-1, 1716.65 m	Zircon_Sample_338	180	95	0.54	13.79	0.35	0.528	0.012	0.91	0.190	0.004	2736	70	2732	52	2738	34	100	x
206/12-1, 1716.65 m	Zircon_Sample_339	33	17	1.03	13.58	0.35	0.525	0.012	0.91	0.188	0.004	2721	70	2721	52	2721	36	100	x
206/12-1, 1716.65 m	Zircon_Sample_340	74	39	0.72	13.97	0.36	0.531	0.012	0.91	0.191	0.004	2748	70	2747	52	2749	34	100	x
206/12-1, 1716.65 m	Zircon_Sample_341	122	64	0.29	14.13	0.36	0.528	0.012	0.91	0.194	0.004	2758	70	2734	52	2776	34	98	x
206/12-1, 1716.65 m	Zircon_Sample_344	162	85	0.39	13.43	0.34	0.523	0.012	0.91	0.186	0.004	2710	69	2712	52	2709	34	100	x
206/12-1, 1716.65 m	Zircon_Sample_345	163	78	0.63	12.49	0.32	0.480	0.011	0.91	0.189	0.004	2642	68	2526	49	2732	35	92	x
206/12-1, 1716.65 m	Zircon_Sample_346	48	25	0.60	13.55	0.35	0.523	0.012	0.91	0.188	0.004	2719	70	2712	52	2724	35	100	x
206/12-1, 1716.65 m	Zircon_Sample_347	107	56	0.49	13.81	0.35	0.529	0.012	0.91	0.190	0.004	2737	70	2735	52	2738	34	100	x
206/12-1, 1716.65 m	Zircon_Sample_348	225	62	0.53	7.24	0.19	0.275	0.006	0.91	0.191	0.004	2141	55	1568	33	2747	34	57	x
206/12-1, 1716.65 m	Zircon_Sample_349	285	135	0.54	12.33	0.31	0.474	0.011	0.92	0.189	0.004	2630	67	2501	48	2731	34	92	x
206/12-1, 1716.65 m	Zircon_Sample_350	215	101	0.45	12.22	0.31	0.468	0.011	0.92	0.189	0.004	2621	67	2476	48	2736	34	90	x
206/12-1, 1716.65 m	Zircon_Sample_351	58	30	0.60	13.42	0.35	0.522	0.012	0.91	0.187	0.004	2710	70	2707	52	2712	35	100	x
206/12-1, 1716.65 m	Zircon_Sample_352	390	149	0.65	9.74	0.25	0.381	0.009	0.92	0.185	0.004	2411	62	2083	42	2701	34	77	x
206/12-1, 1716.65 m	Zircon_Sample_353	335	146	0.38	11.10	0.28	0.435	0.010	0.92	0.185	0.004	2531	65	2329	46	2698	34	86	x
206/12-1, 1716.65 m	Zircon_Sample_354	445	193	1.09	11.05	0.28	0.435	0.010	0.92	0.184	0.004	2527	65	2327	46	2693	34	86	x
206/12-1, 1716.65 m	Zircon_Sample_355	40	21	1.03	13.68	0.35	0.528	0.012	0.91	0.188	0.004	2728	71	2733	53	2724	35	100	x
206/12-1, 1716.65 m	Zircon_Sample_356	621	175	0.48	7.16	0.18	0.281	0.007	0.92	0.185	0.004	2132	54	1599	33	2695	34	59	x
206/12-1, 1716.65 m	Zircon_Sample_357	156	83	0.45	14.29	0.37	0.536	0.013	0.91	0.193	0.004	2769	71	2766	53	2772	34	100	x
206/12-1, 1716.65 m	Zircon_Sample_358	37	19	0.60	13.27	0.35	0.521	0.012	0.91	0.185	0.004	2699	70	2702	52	2698	36	100	x
206/12-1, 1716.65 m	Zircon_Sample_361	301	108	0.55	9.17	0.24	0.358	0.008	0.92	0.186	0.004	2355	60	1973	40	2705	34	73	x
206/12-1, 1716.65 m	Zircon_Sample_362	174	91	0.68	13.61	0.35	0.524	0.012	0.92	0.188	0.004	2723	70	2716	52	2729	34	100	x
206/12-1, 1716.65 m	Zircon_Sample_363	239	125	0.42	13.66	0.35	0.524	0.012	0.91	0.189	0.004	2726	70	2718	52	2732	34	99	x
206/12-1, 1716.65 m	Zircon_Sample_364	64	34	0.79	14.11	0.36	0.525	0.012	0.91	0.195	0.004	2757	71	2719	52	2786	34	98	x
206/12-1, 1716.65 m	Zircon_Sample_365	419	115	0.56	6.94	0.18	0.274	0.006	0.92	0.184	0.004	2104	54	1560	33	2688	34	58	x
206/12-1, 1716.65 m	Zircon_Sample_366	43	22	0.46	13.17	0.34	0.520	0.012	0.91	0.184	0.004	2692	70	2698	52	2688	36	100	x
206/12-1, 1716.65 m	Zircon_Sample_367	320	143	0.66	11.62	0.30	0.446	0.010	0.92	0.189	0.004	2574	66	2378	47	2732	34	87	x
206/12-1, 1716.65 m	Zircon_Sample_368	71	38	0.52	14.71	0.38	0.542	0.013	0.91	0.197	0.004	2796	72	2793	53	2799	34	100	x
206/12-1, 1716.65 m	Zircon_Sample_369	206	79	0.75	9.83	0.25	0.381	0.009	0.91	0.187	0.004	2419	62	2080	42	2719	34	76	x
206/12-1, 1716.65 m	Zircon_Sample_371	45	24	0.98	13.99	0.37	0.531	0.013	0.91	0.191	0.004	2749	72	2744	53	2753	36	100	x
206/12-1, 1716.65 m	Zircon_Sample_372	190	100	0.39	13.83	0.36	0.526	0.012	0.91	0.190	0.004	2738	71	2727	52	2746	34	99	x
206/12-1, 1716.65 m	Zircon_Sample_373	471	105	0.42	5.73	0.15	0.222	0.005	0.92	0.187	0.004	1936	50	1294	28	2717	34	48	x
206/12-1, 1716.65 m	Zircon_Sample_374	296	102	0.60	8.95	0.23	0.346	0.008	0.91	0.187	0.004	2333	60	1917	39	2720	34	70	x
206/12-1, 1716.65 m	Zircon_Sample_375	30	16	0.76	13.35	0.35	0.524	0.013	0.91	0.185	0.004	2704	71	2717	53	2695	37	101	x
206/12-1, 1716.65 m	Zircon_Sample_383	40	22	1.17	14.70	0.39	0.542	0.013	0.91	0.197	0.004	2796	74	2792	54	2798	36	100	x
206/12-1, 1716.65 m	Zircon_Sample_384	27	13	1.22	12.23	0.34	0.469	0.012	0.89	0.189	0.005	2622	73	2477	51	2736	41	91	x
206/12-1, 1716.65 m	Zircon_Sample_385	25	13	1.04	13.69	0.36	0.527	0.013	0.90	0.189	0.004	2729	73	2727	53	2730	37	100	x
206/12-1, 1716.65 m	Zircon_Sample_386	329	148	0.30	11.55	0.30	0.450	0.011	0.92	0.186	0.004	2569	66	2395	47	2709	34	88	x
206/12-1, 1716.65 m	Zircon_Sample_387	257	111	0.45	11.26	0.29	0.433	0.010	0.92	0.189	0.004	2545	66	2317	46	2732	34	85	x
206/12-1, 1716.65 m	Zircon_Sample_388	105	58	0.60	14.33	0.37	0.551	0.013	0.91	0.189	0.004	2772	72	2829	54	2730	34	104	x
206/12-1, 1716.65 m	Zircon_Sample_389	301	152	0.62	13.04	0.34	0.505	0.012	0.92	0.187	0.004	2683	69	2635	51	2719	34	97	x
206/12-1, 1716.65 m	Zircon_Sample_390	427	162	0.61	9.85	0.25	0.380	0.009	0.92	0.188	0.004	2421	63	2077	42	2724	34	76	x
206/12-1, 1716.65 m	Zircon_Sample_391	453	196	0.83	11.14	0.29	0.433	0.010	0.92	0.187	0.004	2535	66	2317	46	2713	34	85	x
206/12-1, 1716.65 m	Zircon_Sample_392	88	46	0.52	13.85	0.36	0.526	0.013	0.91	0.191	0.004	2739	71	2723	53	2751	35	99	x
206/12-1, 1716.65 m	Zircon_Sample_395	66	36	0.91	14.41	0.38	0.540	0.013	0.91	0.194	0.004	2777	73	2783	54	2773	35	100	x
206/12-1, 1716.65 m	Zircon_Sample_396	197	93	0.40	12.29	0.32	0.475	0.011	0.91	0.188	0.004	2627	68	2504	49	2724	34	92	x
206/12-1, 1716.65 m	Zircon_Sample_397	27	15	1.66	15.13	0.40	0.549	0.013	0.91	0.200	0.004	2824	75	2819	55	2827	36	100	x
206/12-1, 1716.65 m	Zircon_Sample_398	278	146	0.45	13.64	0.35	0.525	0.012	0.92	0.188	0.004	2725	71	2720	53	2729	34	100	x
206/12-1, 1716.65 m	Zircon_Sample_399	337	150	0.64	11.36	0.29	0.444	0.011	0.92	0.186	0.004	2553	66	2367	47	2705	34	88	x
206/12-1, 1716.65 m	Zircon_Sample_400	52	28	0.76	14.28	0.38	0.536	0.013	0.91	0.193	0.004	2769	74	2768	54	2769	37	100	x
206/12-1, 1716.65 m	Zircon_Sample_401	290	137	0.30	12.16	0.32	0.474	0.011	0.92	0.186	0.004	2617	68	2501	49	2708	34	92	x
206/12-1, 1716.65 m	Zircon_Sample_402	442	174	0.57	10.09	0.26	0.394	0.009	0.92	0.186	0.004	2443	64	2141	43	2706	34	79	x
206/12-1, 1716.65 m	Zircon_Sample_403	111	59	0.35	14.29	0.37	0.536	0.013	0.91	0.193	0.004	2769	72	2768	54	2771	35	100	x
206/12-1, 1716.65 m	Zircon_Sample_404	282	140	0.44	12.89	0.34	0.496	0.012	0.92	0.188	0.004	2672	70	2599	51	2728	34	95	x
206/12-1, 1716.65 m	Zircon_Sample_405	722	177	0.64	6.30	0.16	0.245	0.006	0.92	0.187	0.004	2019	53	1412	30	2712	34	52	x
206/12-1, 1716.65 m	Zircon_Sample_406	112	60	0.44	14.07	0.37	0.530	0.013	0.91	0.192	0.004	2754	72	2743	53	2763	35	99	x
206/12-1, 1716.65 m	Zircon_Sample_407	39	20	1.34	13.59	0.36	0.524	0.013	0.91	0.188	0.004	2722	72	2717	53	2726	36	100	x
206/12-1, 1716.65 m	Zircon_Sample_408	24	13	2.27	14.40	0.38	0.539	0.013	0.91	0.194	0.004	2776	74	2781	55	2773	37	100	x
206/12-1, 1716.65 m	Zircon_Sample_409	568	141	0.70	6.36	0.17	0.249	0.006	0.91	0.185	0.004	2027	53	1433	31	2701	34	53	x

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon
[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using $(^{207}Pb/^{206}Pb)/(^{238}U/^{206}Pb * 1/137.88)$
[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio
[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

Supplementary files #2- Cover Sequences Detrital Zircon Data

					RATIOS							AGES [Ma]						Conc.
Sample	Analysis	U [ppm][a]	Pb [ppm][a]	Th/U[a]	$^{207}Pb/^{235}U$[b]	2 σ[d]	$^{206}Pb/^{238}U$[b]	2 σ[d]	rho[c]	$^{207}Pb/^{206}Pb$[e]	2 σ[d]	$^{207}Pb/^{235}U$	2 σ	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	%
213/23-1, 3598.36 m	Zircon_sample-007	88	49	1.54	16.62	0.40	0.563	0.013	0.93	0.214	0.002	2913	23	2880	52	2936	14	98
213/23-1, 3598.36 m	Zircon_sample-008	779	390	2.23	12.52	0.65	0.501	0.025	0.95	0.181	0.003	2644	49	2619	106	2663	28	98
213/23-1, 3598.36 m	Zircon_sample-009	422	107	0.58	6.32	0.47	0.254	0.017	0.90	0.180	0.006	2021	65	1460	87	2656	55	55
213/23-1, 3598.36 m	Zircon_sample-010	675	146	0.46	4.97	0.43	0.215	0.017	0.92	0.167	0.006	1814	73	1258	91	2530	57	50
213/23-1, 3598.36 m	Zircon_sample-011	165	91	1.71	15.16	0.87	0.552	0.015	0.47	0.199	0.010	2826	55	2831	61	2821	83	100
213/23-1, 3598.36 m	Zircon_sample-012	285	99	0.64	9.03	0.12	0.346	0.003	0.76	0.189	0.002	2341	12	1916	16	2735	14	70
213/23-1, 3598.36 m	Zircon_sample-014	190	104	0.37	15.08	1.18	0.547	0.020	0.47	0.200	0.014	2821	75	2812	84	2827	112	99
213/23-1, 3598.36 m	Zircon_sample-015	313	165	0.91	13.35	0.22	0.529	0.008	0.92	0.183	0.001	2704	15	2736	33	2681	11	102
213/23-1, 3598.36 m	Zircon_sample-016	1086	289	0.72	6.01	0.28	0.266	0.010	0.80	0.164	0.005	1978	40	1521	50	2496	46	61
213/23-1, 3598.36 m	Zircon_sample-020	700	246	0.92	8.58	0.50	0.351	0.020	0.95	0.177	0.003	2295	53	1941	94	2627	30	74
213/23-1, 3598.36 m	Zircon_sample-021	165	103	0.67	19.76	1.44	0.621	0.015	0.32	0.231	0.016	3080	70	3113	58	3058	110	102
213/23-1, 3598.36 m	Zircon_sample-022	290	161	1.53	15.12	0.57	0.555	0.020	0.94	0.198	0.002	2823	36	2844	81	2807	20	101
213/23-1, 3598.36 m	Zircon_sample-023	99	62	0.99	26.89	0.66	0.620	0.013	0.85	0.314	0.004	3379	24	3111	52	3543	20	88
213/23-1, 3598.36 m	Zircon_sample-024	259	115	1.14	11.41	0.20	0.442	0.006	0.77	0.187	0.002	2557	16	2362	26	2717	18	87
213/23-1, 3598.36 m	Zircon_sample-025	428	193	1.13	11.59	0.61	0.450	0.023	0.98	0.187	0.002	2572	49	2395	103	2715	17	88
213/23-1, 3598.36 m	Zircon_sample-026	195	62	0.41	8.44	0.60	0.318	0.019	0.86	0.192	0.007	2280	64	1782	95	2761	58	65
213/23-1, 3598.36 m	Zircon_sample-027	191	97	1.31	13.92	0.79	0.506	0.029	0.99	0.199	0.002	2744	54	2641	122	2820	15	94
213/23-1, 3598.36 m	Zircon_sample-028	219	115	0.95	14.28	0.38	0.526	0.014	0.99	0.197	0.001	2768	26	2725	59	2800	6	97
213/23-1, 3598.36 m	Zircon_sample-029	769	221	0.24	6.82	0.29	0.288	0.012	0.95	0.172	0.002	2088	38	1630	58	2576	21	63
213/23-1, 3598.36 m	Zircon_sample-033	302	169	2.09	15.72	0.72	0.560	0.018	0.68	0.204	0.007	2860	44	2866	73	2856	55	100
213/23-1, 3598.36 m	Zircon_sample-034	244	58	1.49	5.98	0.34	0.237	0.012	0.88	0.183	0.005	1972	49	1369	62	2682	44	51
213/23-1, 3598.36 m	Zircon_sample-035	121	49	0.47	10.65	0.22	0.407	0.006	0.71	0.190	0.003	2493	19	2203	27	2739	24	80
213/23-1, 3598.36 m	Zircon_sample-036	279	152	0.56	14.90	0.67	0.547	0.023	0.92	0.197	0.004	2809	43	2813	95	2805	29	100
213/23-1, 3598.36 m	Zircon_sample-037	636	320	0.31	12.55	0.88	0.503	0.035	0.98	0.181	0.003	2647	66	2627	149	2662	23	99
213/23-1, 3598.36 m	Zircon_sample-038	487	147	2.15	7.87	0.58	0.303	0.022	0.97	0.189	0.003	2216	67	1704	107	2730	30	62
213/23-1, 3598.36 m	Zircon_sample-039	1607	535	0.20	12.47	1.61	0.333	0.017	0.40	0.272	0.032	2640	122	1852	84	3316	186	56
213/23-1, 3598.36 m	Zircon_sample-040	202	110	1.18	16.48	0.62	0.547	0.016	0.77	0.218	0.005	2905	36	2813	66	2970	39	95
213/23-1, 3598.36 m	Zircon_sample-041	486	230	0.44	12.79	0.48	0.473	0.015	0.84	0.196	0.004	2664	36	2497	66	2794	34	89
213/23-1, 3598.36 m	Zircon_sample-042	356	186	0.32	13.55	0.61	0.524	0.017	0.72	0.187	0.006	2719	43	2717	72	2720	52	100
213/23-1, 3598.36 m	Zircon_sample-046	241	138	0.28	15.97	1.02	0.571	0.034	0.93	0.203	0.005	2875	61	2912	139	2849	37	102
213/23-1, 3598.36 m	Zircon_Sample-047	598	269	0.15	12.42	0.50	0.449	0.014	0.80	0.200	0.005	2637	38	2392	64	2830	40	85
213/23-1, 3598.36 m	Zircon_Sample-048	236	127	0.60	15.86	0.58	0.541	0.018	0.89	0.213	0.003	2869	35	2786	73	2927	26	95
213/23-1, 3598.36 m	Zircon_Sample-049	210	65	0.26	4.60	0.18	0.312	0.008	0.69	0.107	0.003	1750	33	1750	41	1751	52	100
213/23-1, 3598.36 m	Zircon_Sample-050	204	130	0.67	21.65	1.10	0.635	0.024	0.75	0.247	0.008	3168	49	3171	96	3166	53	100
213/23-1, 3598.36 m	Zircon_Sample-051	284	149	1.11	13.48	1.05	0.524	0.031	0.75	0.187	0.010	2714	74	2717	130	2712	84	100
213/23-1, 3598.36 m	Zircon_Sample-052	185	108	0.79	16.73	0.95	0.582	0.025	0.77	0.208	0.007	2920	54	2959	103	2893	58	102
213/23-1, 3598.36 m	Zircon_Sample-053	1137	205	0.16	3.69	0.21	0.180	0.009	0.85	0.149	0.004	1570	45	1066	47	2333	50	46
213/23-1, 3598.36 m	Zircon_Sample-054	364	186	3.98	13.03	0.32	0.511	0.011	0.85	0.185	0.002	2682	23	2661	45	2697	21	99
213/23-1, 3598.36 m	Zircon_Sample-055	220	123	0.90	15.33	0.50	0.557	0.013	0.69	0.200	0.005	2836	31	2854	52	2823	39	101
213/23-1, 3598.36 m	Zircon_Sample-059	531	164	0.39	9.70	0.99	0.310	0.027	0.86	0.227	0.012	2407	95	1739	134	3033	84	57
213/23-1, 3598.36 m	Zircon_Sample-060	210	107	1.62	15.11	0.40	0.511	0.011	0.79	0.215	0.003	2822	25	2660	46	2940	26	90
213/23-1, 3598.36 m	Zircon_Sample-061	657	143	0.25	5.21	0.23	0.217	0.003	0.36	0.174	0.007	1854	37	1268	18	2595	68	49
213/23-1, 3598.36 m	Zircon_Sample-062	498	105	0.23	5.72	0.66	0.212	0.021	0.86	0.196	0.012	1934	100	1237	112	2794	98	44
213/23-1, 3598.36 m	Zircon_Sample-063	237	122	0.36	13.39	0.56	0.516	0.013	0.59	0.188	0.006	2708	39	2680	54	2729	56	98
213/23-1, 3598.36 m	Zircon_Sample-064	299	136	0.29	11.85	1.32	0.455	0.049	0.97	0.189	0.005	2592	104	2416	217	2733	47	88
213/23-1, 3598.36 m	Zircon_Sample-065	452	165	0.37	10.20	0.61	0.366	0.015	0.69	0.202	0.009	2453	55	2009	71	2845	71	71
213/23-1, 3598.36 m	Zircon_Sample-066	488	265	0.76	15.36	1.93	0.542	0.068	0.99	0.205	0.004	2838	120	2793	283	2870	28	97
213/23-1, 3598.36 m	Zircon_Sample-067	295	98	0.10	8.96	0.38	0.331	0.009	0.67	0.196	0.006	2333	39	1843	46	2796	51	66
213/23-1, 3598.36 m	Zircon_Sample-068	164	84	0.65	14.10	0.50	0.512	0.014	0.76	0.200	0.005	2757	33	2667	58	2823	38	94
213/23-1, 3598.36 m	Zircon_Sample-072	976	195	0.83	4.30	0.29	0.200	0.007	0.51	0.156	0.009	1693	56	1173	37	2415	99	49
213/23-1, 3598.36 m	Zircon_Sample-073	367	190	0.80	13.12	0.64	0.516	0.025	0.97	0.184	0.002	2689	46	2682	104	2694	19	100
213/23-1, 3598.36 m	Zircon_Sample-074	65	29	0.41	11.41	0.42	0.452	0.010	0.59	0.183	0.005	2557	35	2404	43	2681	50	90
213/23-1, 3598.36 m	Zircon_Sample-076	135	25	2.18	1.92	0.08	0.183	0.006	0.74	0.076	0.002	1087	29	1083	32	1096	58	99
213/23-1, 3598.36 m	Zircon_Sample-077	198	103	0.91	13.40	0.36	0.520	0.010	0.71	0.187	0.004	2708	25	2700	42	2714	31	99
213/23-1, 3598.36 m	Zircon_Sample-078	1124	201	1.20	4.39	0.52	0.178	0.018	0.86	0.179	0.011	1711	99	1058	100	2640	100	40
213/23-1, 3598.36 m	Zircon_Sample-079	1172	263	0.35	5.27	0.50	0.225	0.018	0.82	0.170	0.009	1864	82	1306	92	2560	92	51
213/23-1, 3598.36 m	Zircon_Sample-080	1025	232	0.37	5.52	0.28	0.226	0.011	0.94	0.177	0.003	1903	43	1315	56	2624	27	50
213/23-1, 3598.36 m	Zircon_Sample-081	374	175	1.43	11.99	0.38	0.468	0.013	0.85	0.186	0.003	2603	30	2474	56	2706	28	91
213/23-1, 3598.36 m	Zircon_Sample-085	263	143	0.35	14.93	0.76	0.545	0.018	0.66	0.199	0.008	2811	48	2803	77	2816	62	100
213/23-1, 3598.36 m	Zircon_Sample-086	264	148	0.20	15.52	0.46	0.561	0.011	0.65	0.201	0.005	2848	28	2872	45	2831	37	101
213/23-1, 3598.36 m	Zircon_Sample-087	199	110	0.32	15.15	0.76	0.553	0.022	0.81	0.199	0.006	2825	48	2838	93	2815	48	101
213/23-1, 3598.36 m	Zircon_Sample-088	305	128	0.79	11.58	0.48	0.419	0.017	0.95	0.200	0.002	2571	39	2257	75	2829	20	80
213/23-1, 3598.36 m	Zircon_Sample-089	361	146	0.25	9.94	0.36	0.405	0.011	0.77	0.178	0.004	2429	33	2190	51	2636	38	83
213/23-1, 3598.36 m	Zircon_Sample-090	254	138	2.03	14.81	0.72	0.545	0.024	0.89	0.197	0.004	2803	46	2806	99	2801	36	100
213/23-1, 3598.36 m	Zircon_Sample-091	1266	327	0.60	6.17	0.39	0.258	0.012	0.76	0.173	0.007	2001	55	1481	63	2590	68	57
213/23-1, 3598.36 m	Zircon_Sample-092	316	128	0.56	10.47	0.69	0.406	0.018	0.66	0.187	0.009	2477	61	2197	81	2716	81	81
213/23-1, 3598.36 m	Zircon_Sample-093	267	145	0.86	16.36	0.65	0.545	0.021	0.97	0.218	0.002	2898	38	2802	88	2965	14	95
213/23-1, 3598.36 m	Zircon_Sample-094	248	139	1.02	16.10	0.42	0.560	0.013	0.89	0.209	0.002	2883	25	2865	53	2895	19	99
213/23-1, 3598.36 m	Zircon_Sample-098	60	31	1.18	15.82	0.80	0.515	0.024	0.92	0.223	0.004	2866	48	2677	102	3002	32	89
213/23-1, 3598.36 m	Zircon_Sample-099	425	177	0.20	10.41	0.51	0.416	0.016	0.80	0.182	0.005	2472	45	2241	74	2667	49	84
213/23-1, 3598.36 m	Zircon_Sample-101	1084	167	0.61	4.31	0.43	0.154	0.015	0.97	0.202	0.005	1695	82	925	83	2846	40	33
213/23-1, 3598.36 m	Zircon_Sample-102	473	231	0.48	14.21	0.66	0.488	0.015	0.65	0.211	0.007	2764	44	2561	63	2915	57	88
213/23-1, 3598.36 m	Zircon_Sample-103	1039	513	0.19	12.24	0.31	0.494	0.012	0.97	0.180	0.001	2623	23	2587	52	2651	10	98
213/23-1, 3598.36 m	Zircon_Sample-104	403	205	0.25	13.11	0.66	0.510	0.017	0.67	0.187	0.007	2688	48	2656	73	2712	62	98
213/23-1, 3598.36 m	Zircon_Sample-105	170	86	0.51	18.17	0.81	0.506	0.021	0.92	0.260	0.004	2999	43	2641	89	3249	27	81
213/23-1, 3598.36 m	Zircon_Sample-106	440	229	1.21	13.18	0.69	0.520	0.022	0.82	0.184	0.006	2692	50	2700	94	2687	50	100
213/23-1, 3598.36 m	Zircon_Sample-107	287	154	0.29	14.81	1.20	0.536	0.031	0.71	0.200	0.011	2803	77	2766	130	2830	93	98
213/23-1, 3598.36 m	Zircon_Sample-111	335	195	0.51	17.10	0.87	0.583	0.015	0.51	0.213	0.009	2940	49	2963	61	2925	71	101
213/23-1, 3598.36 m	Zircon_Sample-112	242	114	0.56	12.98	0.67	0.470	0.019	0.78	0.200	0.006	2678	48	2483	82	2829	53	88
213/23-1, 3598.36 m	Zircon_Sample-113	853	367	0.10	10.67	0.26	0.430	0.006	0.60	0.180	0.004	2495	23	2304	28	2654	32	87
213/23-1, 3598.36 m	Zircon_Sample-114	508	287	0.87	16.05	0.22	0.565	0.003	0.44	0.206	0.003	2880	13	2885	14	2876	20	100
213/23-1, 3598.36 m	Zircon_Sample-115	481	168	0.35	13.92	0.82	0.350	0.019	0.90	0.289	0.007	2744	56	1934	89	3410	40	57
213/23-1, 3598.36 m	Zircon_Sample-116	247	129	1.50	13.38	0.42	0.521	0.013	0.76	0.186	0.004	2707	30	2703	53	2710	34	100
213/23-1, 3598.36 m	Zircon_Sample-117	771	367	0.55	13.04	0.64	0.476	0.014	0.61	0.198	0.008	2682	46	2512	62	2814	63	89
213/23-1, 3598.36 m	Zircon_Sample-118	261	51	0.65	4.92	0.21	0.194	0.007	0.83	0.184	0.004	1806	35	1145	37	2686	38	43
213/23-1, 3598.36 m	Zircon_Sample-119	1813	179	0.19	2.32	0.25	0.099	0.008	0.79	0.171	0.011	1219	77	606	49	2567	111	24
213/23-1, 3598.36 m	Zircon_Sample-120	482	146	0.20	7.69	0.52	0.303	0.019	0.93	0.184	0.005	2195	61	1704	94	2692	42	63
213/23-1, 3598.36 m	Zircon_Sample-124	152	94	0.64	18.41	1.19	0.615	0.037	0.94	0.217	0.005	3011	62	3089	149	2960	34	104
213/23-1, 3598.36 m	Zircon_Sample-125	176	101	0.45	17.49	0.78	0.577	0.019	0.75	0.220	0.006	2962	43	2938	79	2978	47	99
213/23-1, 3598.36 m	Zircon_Sample-126	1111	349	0.24	7.81	0.69	0.314	0.027	0.97	0.181	0.004	2209	79	1759	131	2658	35	66
213/23-1, 3598.36 m	Zircon_Sample-127	84	46	0.63	15.41	0.64	0.553	0.017	0.75	0.202	0.006	2841	40	2837	72	2844	45	100
213/23-1, 3598.36 m	Zircon_Sample-128	238	132	0.45	15.27	0.75	0.554	0.018	0.67	0.200	0.007	2832	47	2844	75	2824	59	101
213/23-1, 3598.36 m	Zircon_Sample-129	267	139	1.31	13.44	0.49	0.522	0.018	0.92	0.187	0.003	2711	34	2706	74	2714	23	100
213/23-1, 3598.36 m	Zircon_Sample-130	869	361	0.14	10.07	0.27	0.415	0.009	0.83	0.176	0.003	2442	25	2239	43	2615	25	86
213/23-1, 3598.36 m	Zircon_Sample-131	147	77	1.00	14.52	0.44	0.523	0.014	0.86	0.201	0.003	2784	29	2712	58	2837	25	96
213/23-1, 3598.36 m	Zircon_Sample-132	186	101	0.58	14.88	0.44	0.546	0.013	0.83	0.198	0.003	2807	28	2808	56	2807	27	100
213/23-1, 3598.36 m	Zircon_Sample-133	882	393	0.41	12.47	0.79	0.445	0.016	0.58	0.203	0.011	2640	60	2374	73	2851	85	83
213/23-1, 3598.36 m	Zircon_Sample-137	907	316	0.03	8.24	0.41	0.349	0.014	0.80	0.171	0.005	2258	45	1929	66	2571	50	75
213/23-1, 3598.36 m	Zircon_Sample-138	380	177	0.99	12.60	0.38	0.465	0.007	0.54	0.197	0.005	2650	28	2460	33	2799	42	88
213/23-1, 3598.36 m	Zircon_Sample-139	1648	332	1.03	5.26	0.19	0.202	0.007	0.97	0.189	0.002	1863	30	1184	37	2737	15	43
213/23-1, 3598.36 m	Zircon_Sample-140	645	251	1.21	10.03	0.47	0.390	0.014	0.76	0.187	0.006	2438	43	2121	64	2714	50	78
213/23-1, 3598.36 m	Zircon_Sample-141	437	157	0.33	10.11	0.60	0.360	0.019	0.90	0.203	0.005	2445	55	1984	91	2854	43	70
213/23-1, 3598.36 m	Zircon_Sample-142	1647	493	0.53	7.45	0.34	0.299	0.012	0.90	0.181	0.004	2168	41	1689	60	2658	33	64
213/23-1, 3598.36 m	Zircon_Sample-143	125	72	0.24	15.68	0.37	0.571	0.010	0.77	0.199	0.003	2857	22	2910	42	2820	24	103
213/23-1, 3598.36 m	Zircon_Sample-144	903	321	0.82	9.06	0.36	0.356	0.012	0.88	0.185	0.004	2344	36	1962	59	2695	31	73
213/23-1, 3598.36 m	Zircon_Sample-145	1433	254	0.54	4.32	0.20	0.177	0.007	0.90	0.176	0.004	1697	38	1053	40	2619	33	40
213/23-1, 3598.36 m	Zircon_Sample-146	534	296	0.11	15.52	0.85	0.555	0.018	0.60	0.203	0.009	2848	52	2844	75	2850	71	100
213/23-1, 3598.36 m	Zircon_Sample-150	502	262	0.51	14.11	1.43	0.522	0.052	0.99	0.196	0.003	2757	97	2709	222	2792	27	97
213/23-1, 3598.36 m	Zircon_Sample-151	175	97	0.62	15.28	0.18	0.552	0.004	0.56	0.201	0.002	2833	11	2833	15	2832	16	100
213/23-1, 3598.36 m	Zircon_Sample-152	824	255	0.21	7.32	0.24	0.310	0.008	0.79	0.171	0.003	2152	29	1741	39	2570	33	68
213/23-1, 3598.36 m	Zircon_Sample-153	290	164	0.85	16.47	0.36	0.565	0.010	0.78	0.212	0.003	2904	21	2886	40	2918	23	99
213/23-1, 3598.36 m	Zircon_Sample-154	182	88	0.34	13.23	0.34	0.484	0.008	0.67	0.198	0.004	2696	24	2543	36	2813	31	90

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon
[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using ($^{207}Pb/^{206}Pb$)/($^{238}U/^{206}Pb$ * 1/137.88)
[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio
[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)
[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

					RATIOS							AGES [Ma]						Conc.
Sample	Analysis	U [ppm][a]	Pb [ppm][a]	Th/U[a]	$^{207}Pb/^{235}U$[b]	2 σ[d]	$^{206}Pb/^{238}U$[b]	2 σ[d]	rho[c]	$^{207}Pb/^{206}Pb$[e]	2 σ[d]	$^{207}Pb/^{235}U$	2 σ	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	%
204/27-1, 2094.65 m	Zircon_sample-007	142	77	0.45	14.10	0.32	0.544	0.009	0.71	0.188	0.003	2757	22	2800	37	2725	26	103
204/27-1, 2094.65 m	Zircon_sample-008	21	11	0.35	13.43	0.45	0.517	0.009	0.53	0.189	0.005	2710	32	2685	39	2729	47	98
204/27-1, 2094.65 m	Zircon_sample-009	73	36	0.65	13.18	0.32	0.500	0.008	0.68	0.191	0.003	2693	23	2614	36	2752	29	95
204/27-1, 2094.65 m	Zircon_sample-010	257	134	0.15	13.57	0.48	0.521	0.017	0.92	0.189	0.003	2720	34	2703	72	2734	23	99
204/27-1, 2094.65 m	Zircon_sample-011	46	25	0.84	14.14	0.44	0.536	0.015	0.90	0.191	0.003	2759	29	2767	62	2754	22	100
204/27-1, 2094.65 m	Zircon_sample-012	608	321	0.48	14.42	0.51	0.528	0.015	0.82	0.198	0.004	2778	34	2733	65	2810	33	97
204/27-1, 2094.65 m	Zircon_sample-013	43	23	0.44	13.74	0.43	0.522	0.006	0.37	0.191	0.006	2732	30	2708	26	2750	48	98
204/27-1, 2094.65 m	Zircon_sample-014	900	334	0.03	9.30	0.51	0.371	0.017	0.83	0.182	0.006	2368	51	2032	80	2670	51	76
204/27-1, 2094.65 m	Zircon_sample-020	121	66	0.73	14.53	0.50	0.544	0.014	0.73	0.194	0.005	2785	33	2800	57	2775	39	101
204/27-1, 2094.65 m	Zircon_sample-021	127	66	0.27	13.54	0.44	0.518	0.014	0.86	0.190	0.003	2718	30	2691	61	2739	27	98
204/27-1, 2094.65 m	Zircon_sample-022	422	156	0.17	9.47	0.27	0.369	0.009	0.87	0.186	0.003	2385	26	2024	43	2710	23	75
204/27-1, 2094.65 m	Zircon_sample-023	193	105	0.24	14.06	0.28	0.542	0.006	0.56	0.188	0.003	2754	19	2793	25	2725	27	102
204/27-1, 2094.65 m	Zircon_sample-024	199	106	0.59	13.98	0.56	0.536	0.019	0.89	0.189	0.003	2748	38	2765	80	2736	30	101
204/27-1, 2094.65 m	Zircon_sample-025	164	73	0.63	11.72	0.39	0.444	0.009	0.58	0.192	0.005	2583	31	2367	38	2757	45	86
204/27-1, 2094.65 m	Zircon_sample-026	36	19	0.62	13.65	0.54	0.527	0.014	0.68	0.188	0.005	2725	37	2730	60	2722	47	100
204/27-1, 2094.65 m	Zircon_sample-027	179	97	1.41	14.40	0.40	0.543	0.013	0.85	0.192	0.003	2777	26	2797	53	2762	24	101
204/27-1, 2094.65 m	Zircon_sample-028	83	42	1.12	13.45	0.46	0.508	0.012	0.71	0.192	0.005	2712	33	2649	53	2759	40	96
204/27-1, 2094.65 m	Zircon_sample-029	1141	293	0.01	5.70	0.18	0.257	0.006	0.76	0.161	0.003	1931	28	1472	32	2467	36	60
204/27-1, 2094.65 m	Zircon_sample-033	148	73	0.29	12.56	0.23	0.490	0.006	0.66	0.186	0.003	2647	17	2569	25	2707	22	95
204/27-1, 2094.65 m	Zircon_sample-034	20	10	0.23	12.80	0.69	0.493	0.020	0.75	0.188	0.007	2665	51	2582	86	2728	58	95
204/27-1, 2094.65 m	Zircon_sample-035	83	41	0.36	13.37	0.54	0.492	0.015	0.74	0.197	0.005	2706	38	2581	65	2801	44	92
204/27-1, 2094.65 m	Zircon_sample-036	47	24	0.75	13.70	0.43	0.517	0.009	0.58	0.192	0.005	2729	30	2687	40	2761	42	97
204/27-1, 2094.65 m	Zircon_sample-037	72	37	0.39	13.05	0.51	0.510	0.012	0.61	0.185	0.006	2683	37	2659	51	2701	51	98
204/27-1, 2094.65 m	Zircon_sample-038	70	36	0.40	13.30	0.51	0.519	0.009	0.46	0.186	0.006	2701	37	2695	39	2706	57	100
204/27-1, 2094.65 m	Zircon_sample-039	28	15	0.71	14.22	0.48	0.537	0.009	0.52	0.192	0.006	2764	32	2769	39	2761	47	100
204/27-1, 2094.65 m	Zircon_sample-041	66	22	0.75	8.59	0.24	0.328	0.008	0.87	0.190	0.003	2296	25	1829	38	2742	23	67
204/27-1, 2094.65 m	Zircon_sample-042	214	113	0.51	13.55	0.58	0.526	0.020	0.87	0.187	0.004	2719	41	2725	83	2715	35	100
204/27-1, 2094.65 m	Zircon_Sample-047	318	121	0.25	9.48	0.55	0.381	0.021	0.93	0.180	0.004	2385	53	2080	96	2657	36	78
204/27-1, 2094.65 m	Zircon_Sample-048	72	39	1.09	14.69	0.41	0.546	0.008	0.51	0.195	0.005	2796	26	2809	32	2786	39	101
204/27-1, 2094.65 m	Zircon_Sample-049	370	157	0.70	10.71	0.45	0.423	0.009	0.53	0.183	0.007	2498	39	2276	43	2684	59	85
204/27-1, 2094.65 m	Zircon_Sample-050	284	155	0.26	13.93	0.30	0.544	0.009	0.74	0.186	0.003	2745	20	2801	36	2704	24	104
204/27-1, 2094.65 m	Zircon_Sample-051	80	42	2.29	13.60	0.45	0.526	0.012	0.69	0.187	0.004	2722	31	2725	50	2720	39	100
204/27-1, 2094.65 m	Zircon_Sample-052	1880	934	0.16	11.88	0.57	0.496	0.017	0.69	0.174	0.006	2595	45	2599	71	2592	58	100
204/27-1, 2094.65 m	Zircon_Sample-053	60	31	0.86	13.42	0.56	0.518	0.012	0.53	0.188	0.007	2709	39	2689	49	2724	58	99
204/27-1, 2094.65 m	Zircon_Sample-054	113	62	0.85	15.69	0.82	0.554	0.027	0.93	0.205	0.004	2858	50	2843	112	2868	30	99
204/27-1, 2094.65 m	Zircon_Sample-055	365	107	0.77	7.20	0.26	0.293	0.008	0.80	0.178	0.004	2136	32	1657	42	2635	35	63
204/27-1, 2094.65 m	Zircon_Sample-059	67	36	0.81	14.38	0.48	0.540	0.011	0.62	0.193	0.005	2775	32	2782	47	2770	44	100
204/27-1, 2094.65 m	Zircon_Sample-060	72	38	0.47	13.99	0.44	0.532	0.014	0.82	0.191	0.003	2749	30	2749	58	2749	30	100
204/27-1, 2094.65 m	Zircon_Sample-061	129	68	0.43	13.59	0.69	0.526	0.015	0.57	0.187	0.008	2721	48	2724	65	2719	69	100
204/27-1, 2094.65 m	Zircon_Sample-062	590	307	0.28	13.38	0.61	0.520	0.020	0.85	0.187	0.004	2707	43	2700	86	2712	40	100
204/27-1, 2094.65 m	Zircon_Sample-063	757	259	0.37	8.60	0.30	0.342	0.011	0.90	0.183	0.003	2296	31	1894	51	2677	25	71
204/27-1, 2094.65 m	Zircon_Sample-064	221	116	0.55	13.43	0.49	0.522	0.010	0.51	0.187	0.006	2711	34	2709	41	2712	52	100
204/27-1, 2094.65 m	Zircon_Sample-065	141	73	1.16	13.93	0.54	0.520	0.017	0.83	0.194	0.004	2745	37	2699	72	2780	35	97
204/27-1, 2094.65 m	Zircon_Sample-066	107	55	1.37	13.06	0.87	0.513	0.030	0.88	0.185	0.006	2684	63	2670	129	2694	52	99
204/27-1, 2094.65 m	Zircon_Sample-067	47	24	1.09	13.70	0.42	0.513	0.009	0.58	0.194	0.005	2729	29	2668	39	2775	41	96
204/27-1, 2094.65 m	Zircon_Sample-068	187	92	5.59	12.69	0.44	0.492	0.012	0.70	0.187	0.005	2657	33	2578	52	2717	41	95
204/27-1, 2094.65 m	Zircon_Sample-072	632	212	0.42	8.51	0.43	0.335	0.017	0.98	0.184	0.002	2287	46	1863	81	2691	17	69
204/27-1, 2094.65 m	Zircon_Sample-073	229	118	0.57	13.25	0.27	0.515	0.009	0.81	0.187	0.002	2697	19	2676	36	2713	20	99
204/27-1, 2094.65 m	Zircon_Sample-074	80	42	0.63	13.75	0.40	0.521	0.009	0.62	0.191	0.004	2733	28	2703	40	2755	38	98
204/27-1, 2094.65 m	Zircon_Sample-075	72	37	1.34	13.26	0.41	0.519	0.012	0.75	0.185	0.004	2698	29	2694	51	2702	34	100
204/27-1, 2094.65 m	Zircon_Sample-076	673	216	0.38	8.08	0.17	0.322	0.004	0.60	0.182	0.003	2240	20	1798	20	2672	29	67
204/27-1, 2094.65 m	Zircon_Sample-077	71	35	5.94	12.54	0.39	0.500	0.010	0.65	0.182	0.004	2646	29	2614	43	2670	39	98
204/27-1, 2094.65 m	Zircon_Sample-078	54	28	1.59	13.49	0.34	0.524	0.009	0.66	0.187	0.004	2714	24	2715	37	2714	32	100
204/27-1, 2094.65 m	Zircon_Sample-079	65	35	1.01	14.48	0.59	0.538	0.013	0.58	0.195	0.006	2781	39	2776	53	2785	54	100
204/27-1, 2094.65 m	Zircon_Sample-080	165	85	0.77	13.34	0.59	0.518	0.022	0.94	0.187	0.003	2704	42	2690	91	2714	26	99
204/27-1, 2094.65 m	Zircon_Sample-081	149	80	0.70	13.95	0.30	0.537	0.008	0.73	0.188	0.003	2747	20	2771	35	2729	24	102
204/27-1, 2094.65 m	Zircon_Sample-085	109	53	0.34	12.77	0.63	0.487	0.020	0.84	0.190	0.005	2663	46	2560	88	2742	43	93
204/27-1, 2094.65 m	Zircon_Sample-086	57	30	0.75	13.97	0.39	0.524	0.010	0.67	0.194	0.004	2748	26	2714	41	2772	34	98
204/27-1, 2094.65 m	Zircon_Sample-087	142	75	0.93	13.81	0.36	0.530	0.010	0.71	0.189	0.004	2737	25	2741	42	2734	31	100
204/27-1, 2094.65 m	Zircon_Sample-088	67	36	1.00	14.22	0.43	0.535	0.013	0.82	0.193	0.003	2765	29	2761	56	2767	28	100
204/27-1, 2094.65 m	Zircon_Sample-089	72	38	1.01	13.95	0.62	0.527	0.010	0.43	0.192	0.008	2746	42	2728	43	2760	66	99
204/27-1, 2094.65 m	Zircon_Sample-090	312	167	1.20	14.05	0.87	0.535	0.021	0.65	0.191	0.009	2753	59	2761	90	2747	78	101
204/27-1, 2094.65 m	Zircon_Sample-091	945	347	0.08	8.74	0.52	0.368	0.019	0.88	0.172	0.005	2311	54	2018	91	2582	47	78
204/27-1, 2094.65 m	Zircon_Sample-092	43	23	0.82	14.51	0.54	0.540	0.012	0.61	0.195	0.006	2784	35	2783	51	2784	48	100
204/27-1, 2094.65 m	Zircon_Sample-094	155	83	1.20	14.15	0.42	0.535	0.012	0.77	0.192	0.004	2760	28	2762	52	2758	31	100
204/27-1, 2094.65 m	Zircon_Sample-098	50	27	0.91	14.25	0.77	0.538	0.020	0.68	0.192	0.008	2766	51	2773	83	2761	65	100
204/27-1, 2094.65 m	Zircon_Sample-099	1298	223	0.18	3.34	0.10	0.172	0.003	0.54	0.141	0.003	1492	23	1022	15	2242	42	46
204/27-1, 2094.65 m	Zircon_Sample-100	513	266	1.76	13.11	0.57	0.518	0.017	0.76	0.184	0.005	2688	41	2690	72	2686	47	100
204/27-1, 2094.65 m	Zircon_Sample-101	123	51	1.19	10.90	0.31	0.414	0.010	0.84	0.191	0.003	2514	27	2235	45	2749	25	81
204/27-1, 2094.65 m	Zircon_Sample-102	51	27	1.08	14.31	0.74	0.538	0.012	0.42	0.193	0.009	2770	49	2775	49	2767	77	100
204/27-1, 2094.65 m	Zircon_Sample-103	50	27	0.74	13.68	0.51	0.528	0.011	0.53	0.188	0.006	2728	36	2734	45	2723	52	100
204/27-1, 2094.65 m	Zircon_Sample-104	78	42	0.14	13.83	0.40	0.532	0.009	0.60	0.188	0.004	2738	27	2751	38	2728	38	101
204/27-1, 2094.65 m	Zircon_Sample-105	29	16	0.83	15.57	0.52	0.557	0.014	0.75	0.203	0.004	2851	32	2856	57	2847	36	100
204/27-1, 2094.65 m	Zircon_Sample-106	84	45	0.81	14.12	0.36	0.535	0.011	0.83	0.191	0.003	2758	24	2762	48	2755	23	100
204/27-1, 2094.65 m	Zircon_Sample-107	192	94	0.59	12.90	0.34	0.491	0.012	0.93	0.190	0.002	2672	25	2577	51	2745	16	94
204/27-1, 2094.65 m	Zircon_Sample-111	203	108	0.64	13.66	0.30	0.530	0.010	0.87	0.187	0.002	2727	21	2742	42	2715	18	101
204/27-1, 2094.65 m	Zircon_Sample-112	748	187	0.22	6.46	0.28	0.251	0.010	0.91	0.187	0.003	2041	38	1441	51	2717	29	53
204/27-1, 2094.65 m	Zircon_Sample-113	13	7	2.51	14.07	0.66	0.531	0.014	0.58	0.192	0.007	2754	44	2745	60	2761	63	99
204/27-1, 2094.65 m	Zircon_Sample-114	55	29	1.04	13.41	0.61	0.528	0.020	0.82	0.184	0.005	2709	43	2732	83	2692	43	101
204/27-1, 2094.65 m	Zircon_Sample-115	61	33	0.42	14.78	0.50	0.551	0.009	0.48	0.195	0.006	2801	32	2827	38	2782	49	102
204/27-1, 2094.65 m	Zircon_Sample-116	256	133	0.26	13.26	0.46	0.519	0.015	0.82	0.185	0.004	2699	33	2694	62	2702	33	100
204/27-1, 2094.65 m	Zircon_Sample-117	47	25	0.53	14.35	0.78	0.538	0.020	0.68	0.194	0.008	2773	52	2773	83	2773	66	100
204/27-1, 2094.65 m	Zircon_Sample-118	116	63	1.05	14.20	0.40	0.539	0.011	0.76	0.191	0.004	2763	27	2778	48	2753	30	101
204/27-1, 2094.65 m	Zircon_Sample-120	182	79	0.21	11.10	0.38	0.435	0.009	0.59	0.185	0.005	2532	32	2326	39	2701	45	86
204/27-1, 2094.65 m	Zircon_Sample-124	28	15	1.25	14.18	0.51	0.531	0.008	0.41	0.194	0.006	2762	34	2747	33	2773	54	99
204/27-1, 2094.65 m	Zircon_Sample-125	37	20	0.76	14.42	0.57	0.537	0.015	0.70	0.195	0.005	2778	38	2772	63	2781	46	100
204/27-1, 2094.65 m	Zircon_Sample-126	87	46	0.89	14.00	0.39	0.529	0.013	0.87	0.192	0.003	2750	26	2737	54	2760	22	99
204/27-1, 2094.65 m	Zircon_Sample-127	663	300	0.68	11.44	0.54	0.453	0.016	0.77	0.183	0.006	2560	44	2406	72	2684	50	90
204/27-1, 2094.65 m	Zircon_Sample-128	1891	327	0.03	3.92	0.24	0.173	0.009	0.82	0.164	0.006	1617	50	1029	48	2499	60	41
204/27-1, 2094.65 m	Zircon_Sample-129	45	24	1.83	13.97	0.62	0.534	0.012	0.53	0.190	0.007	2748	42	2759	52	2739	62	101
204/27-1, 2094.65 m	Zircon_Sample-130	72	38	0.76	13.60	0.41	0.528	0.010	0.61	0.187	0.005	2723	29	2732	41	2716	40	101
204/27-1, 2094.65 m	Zircon_Sample-131	102	55	0.67	14.26	0.38	0.542	0.010	0.68	0.191	0.004	2767	25	2790	41	2750	32	101
204/27-1, 2094.65 m	Zircon_Sample-132	54	29	0.83	14.37	0.45	0.532	0.011	0.65	0.196	0.005	2774	30	2750	45	2792	39	98
204/27-1, 2094.65 m	Zircon_Sample-133	79	42	0.34	14.29	0.31	0.534	0.007	0.57	0.194	0.004	2769	21	2759	28	2776	30	99
204/27-1, 2094.65 m	Zircon_Sample-137	28	15	0.94	14.11	0.80	0.533	0.019	0.63	0.192	0.008	2757	54	2753	80	2760	72	100
204/27-1, 2094.65 m	Zircon_Sample-138	47	25	1.89	13.46	0.43	0.524	0.012	0.71	0.186	0.004	2713	30	2716	50	2710	38	100
204/27-1, 2094.65 m	Zircon_Sample-139	940	386	0.28	10.04	0.27	0.411	0.008	0.76	0.177	0.003	2439	25	2219	39	2628	29	84
204/27-1, 2094.65 m	Zircon_Sample-140	86	45	0.60	13.65	0.42	0.524	0.008	0.49	0.189	0.005	2726	29	2715	33	2733	44	99
204/27-1, 2094.65 m	Zircon_Sample-141	92	49	0.49	14.32	0.54	0.535	0.014	0.67	0.194	0.005	2771	36	2762	57	2778	46	99
204/27-1, 2094.65 m	Zircon_Sample-142	96	50	0.58	13.61	0.37	0.525	0.011	0.78	0.188	0.003	2723	26	2720	48	2725	28	100
204/27-1, 2094.65 m	Zircon_Sample-143	101	53	0.54	13.89	0.37	0.529	0.011	0.82	0.191	0.003	2743	25	2735	48	2748	25	100
204/27-1, 2094.65 m	Zircon_Sample-144	70	39	0.95	14.71	0.87	0.559	0.016	0.48	0.191	0.010	2796	56	2861	66	2750	85	104
204/27-1, 2094.65 m	Zircon_Sample-145	335	176	0.17	13.65	0.36	0.527	0.006	0.47	0.188	0.004	2726	25	2728	27	2724	38	100
204/27-1, 2094.65 m	Zircon_Sample-146	282	150	0.68	14.09	0.39	0.533	0.010	0.70	0.192	0.004	2756	26	2753	43	2758	33	100
204/27-1, 2094.65 m	Zircon_Sample-150	641	332	0.12	13.12	0.51	0.518	0.015	0.77	0.184	0.005	2688	37	2690	65	2687	41	100
204/27-1, 2094.65 m	Zircon_Sample-151	483	226	0.15	12.08	0.38	0.468	0.012	0.78	0.187	0.004	2610	30	2476	51	2716	32	91
204/27-1, 2094.65 m	Zircon_Sample-152	42	23	0.90	14.28	0.92	0.541	0.027	0.78	0.192	0.008	2769	61	2787	115	2755	66	101
204/27-1, 2094.65 m	Zircon_Sample-153	226	119	0.58	13.52	0.35	0.526	0.008	0.60	0.186	0.004	2717	24	2725	34	2710	34	101
204/27-1, 2094.65 m	Zircon_Sample-154	1030	263	0.05	5.42	0.29	0.255	0.006	0.45	0.154	0.007	1887	46	1465	31	2391	81	61

[a] U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b] Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using $(^{207}Pb/^{206}Pb)/(^{238}U/^{206}Pb * 1/137.88)$

[c] Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d] Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e] Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

					RATIOS							AGES [Ma]						Conc.
Sample	**Analysis**	**U [ppm][a]**	**Pb [ppm][a]**	**Th/U[a]**	**$^{207}Pb/^{235}U$[b]**	**2σ[d]**	**$^{206}Pb/^{238}U$[b]**	**2σ[d]**	**rho[c]**	**$^{207}Pb/^{206}Pb$[e]**	**2σ[d]**	**$^{207}Pb/^{235}U$**	**2σ**	**$^{206}Pb/^{238}U$**	**2σ**	**$^{207}Pb/^{206}Pb$**	**2σ**	**%**
202/3-1 1642.50 m	Zircon_sample-007	217	106	0.18	13.41	0.45	0.490	0.013	0.78	0.198	0.004	2709	32	2573	56	2812	34	91
202/3-1 1642.50 m	Zircon_sample-008	2295	360	0.20	3.05	0.35	0.157	0.015	0.84	0.141	0.009	1420	89	939	85	2240	109	42
202/3-1 1642.50 m	Zircon_sample-010	134	71	1.68	13.64	0.64	0.527	0.015	0.61	0.188	0.007	2725	44	2729	63	2722	61	100
202/3-1 1642.50 m	Zircon_sample-011	2306	346	0.25	2.93	0.16	0.150	0.005	0.57	0.142	0.006	1389	40	900	25	2247	76	40
202/3-1 1642.50 m	Zircon_sample-012	307	155	1.05	12.98	0.37	0.504	0.003	0.22	0.187	0.005	2678	27	2631	13	2714	45	97
202/3-1 1642.50 m	Zircon_sample-013	55	30	0.67	15.10	0.76	0.557	0.013	0.45	0.197	0.009	2822	48	2853	53	2799	73	102
202/3-1 1642.50 m	Zircon_sample-015	321	171	0.75	14.04	0.93	0.534	0.011	0.31	0.191	0.012	2752	63	2756	45	2749	104	100
202/3-1 1642.50 m	Zircon_sample-016	282	99	0.52	9.68	0.35	0.352	0.011	0.86	0.199	0.004	2404	33	1943	52	2822	29	69
202/3-1 1642.50 m	Zircon_sample-020	34	19	0.34	14.81	1.00	0.546	0.022	0.59	0.197	0.011	2803	65	2810	91	2797	90	100
202/3-1 1642.50 m	Zircon_sample-021	117	63	0.73	14.28	0.98	0.540	0.021	0.58	0.192	0.011	2769	65	2783	89	2758	92	101
202/3-1 1642.50 m	Zircon_sample-022	380	183	0.63	12.37	0.76	0.482	0.018	0.61	0.186	0.009	2633	58	2535	79	2710	80	94
202/3-1 1642.50 m	Zircon_sample-024	246	98	0.91	10.55	0.74	0.397	0.025	0.90	0.193	0.006	2485	65	2155	115	2767	51	78
202/3-1 1642.50 m	Zircon_sample-025	104	56	0.93	14.45	0.66	0.539	0.016	0.64	0.195	0.007	2780	43	2778	66	2781	58	100
202/3-1 1642.50 m	Zircon_sample-026	148	78	1.70	13.80	0.38	0.526	0.009	0.63	0.190	0.004	2736	26	2724	39	2744	35	99
202/3-1 1642.50 m	Zircon_sample-027	732	293	0.25	10.34	0.60	0.400	0.016	0.68	0.187	0.008	2466	54	2170	73	2720	70	80
202/3-1 1642.50 m	Zircon_sample-028	230	85	0.88	9.76	0.84	0.371	0.019	0.59	0.191	0.013	2413	79	2032	89	2751	114	74
202/3-1 1642.50 m	Zircon_sample-029	199	52	1.30	7.03	0.56	0.260	0.020	0.97	0.196	0.004	2116	71	1489	103	2796	29	53
202/3-1 1642.50 m	Zircon_sample-033	822	193	0.39	2.80	0.18	0.234	0.009	0.61	0.087	0.004	1356	48	1358	48	1353	97	100
202/3-1 1642.50 m	Zircon_sample-034	2930	199	0.20	1.68	0.15	0.068	0.006	0.95	0.179	0.005	1001	59	424	36	2648	46	16
202/3-1 1642.50 m	Zircon_sample-036	717	105	0.99	3.84	0.46	0.146	0.017	0.98	0.191	0.005	1602	97	878	97	2751	39	32
202/3-1 1642.50 m	Zircon_sample-037	85	46	1.24	13.72	0.46	0.533	0.007	0.42	0.187	0.006	2731	32	2754	31	2713	50	101
202/3-1 1642.50 m	Zircon_sample-038	431	204	0.91	12.60	0.40	0.473	0.013	0.88	0.193	0.003	2650	30	2496	58	2770	25	90
202/3-1 1642.50 m	Zircon_sample-039	873	189	0.86	5.45	0.42	0.216	0.007	0.39	0.183	0.013	1892	66	1261	35	2678	117	47
202/3-1 1642.50 m	Zircon_sample-040	238	64	0.50	7.01	0.20	0.267	0.007	0.85	0.190	0.003	2112	26	1527	34	2743	25	56
202/3-1 1642.50 m	Zircon_sample-041	377	97	0.83	6.64	0.47	0.258	0.018	0.98	0.187	0.003	2065	63	1478	92	2714	23	54
202/3-1 1642.50 m	Zircon_sample-042	290	124	1.03	11.31	0.36	0.428	0.013	0.98	0.192	0.001	2549	29	2297	60	2757	11	83
202/3-1 1642.50 m	Zircon_sample-046	21	8	0.41	7.10	0.44	0.390	0.015	0.63	0.132	0.006	2124	56	2122	71	2127	85	100
202/3-1 1642.50 m	Zircon_Sample-047	114	60	0.49	14.21	1.07	0.528	0.021	0.52	0.195	0.013	2764	71	2734	87	2786	105	98
202/3-1 1642.50 m	Zircon_Sample-048	175	94	0.40	13.92	0.78	0.534	0.015	0.50	0.189	0.009	2744	53	2759	63	2733	80	101
202/3-1 1642.50 m	Zircon_Sample-049	261	87	0.50	5.51	0.15	0.332	0.008	0.91	0.120	0.001	1903	24	1850	40	1960	20	94
202/3-1 1642.50 m	Zircon_Sample-050	216	32	0.91	1.56	0.08	0.149	0.004	0.61	0.076	0.003	954	30	898	25	1086	78	83
202/3-1 1642.50 m	Zircon_Sample-051	2475	222	0.39	1.51	0.10	0.090	0.005	0.77	0.122	0.005	935	41	553	28	1991	77	28
202/3-1 1642.50 m	Zircon_Sample-052	1437	126	0.70	2.23	0.11	0.088	0.003	0.70	0.184	0.006	1191	34	544	18	2688	57	20
202/3-1 1642.50 m	Zircon_Sample-053	113	60	0.37	14.10	0.87	0.534	0.026	0.78	0.191	0.007	2756	58	2760	107	2753	63	100
202/3-1 1642.50 m	Zircon_Sample-054	1220	181	0.57	3.82	0.31	0.148	0.012	0.96	0.187	0.004	1597	65	892	65	2713	38	33
202/3-1 1642.50 m	Zircon_Sample-055	1283	178	0.75	3.94	0.15	0.138	0.003	0.61	0.206	0.006	1622	30	836	18	2878	48	29
202/3-1 1642.50 m	Zircon_Sample-059	355	128	0.48	9.37	0.50	0.360	0.018	0.93	0.189	0.004	2375	49	1981	84	2733	32	72
202/3-1 1642.50 m	Zircon_Sample-061	356	109	0.64	8.10	0.40	0.305	0.014	0.93	0.193	0.004	2243	45	1716	70	2765	30	62
202/3-1 1642.50 m	Zircon_Sample-062	258	142	0.15	15.10	0.65	0.552	0.016	0.68	0.198	0.006	2821	41	2833	67	2813	52	101
202/3-1 1642.50 m	Zircon_Sample-063	110	17	0.46	1.57	0.05	0.156	0.003	0.73	0.073	0.001	959	18	935	19	1014	41	92
202/3-1 1642.50 m	Zircon_Sample-064	260	57	1.01	5.88	0.21	0.220	0.007	0.84	0.193	0.004	1959	31	1284	35	2772	32	46
202/3-1 1642.50 m	Zircon_Sample-065	161	88	0.60	14.32	0.42	0.546	0.010	0.61	0.190	0.004	2771	28	2807	41	2745	39	102
202/3-1 1642.50 m	Zircon_Sample-066	179	97	0.61	14.68	0.59	0.543	0.013	0.60	0.196	0.006	2795	38	2798	55	2792	52	100
202/3-1 1642.50 m	Zircon_Sample-068	91	49	0.33	14.44	0.49	0.540	0.012	0.65	0.194	0.005	2779	32	2785	50	2774	43	100
202/3-1 1642.50 m	Zircon_Sample-072	2098	205	0.48	2.04	0.15	0.098	0.007	0.92	0.152	0.005	1130	52	600	40	2368	51	25
202/3-1 1642.50 m	Zircon_Sample-073	217	113	0.19	13.35	0.37	0.522	0.009	0.63	0.185	0.004	2705	26	2709	39	2702	36	100
202/3-1 1642.50 m	Zircon_Sample-074	157	86	0.63	14.58	0.81	0.547	0.014	0.47	0.193	0.010	2788	53	2812	60	2771	81	101
202/3-1 1642.50 m	Zircon_Sample-076	241	130	0.42	14.41	0.42	0.542	0.010	0.66	0.193	0.004	2777	28	2792	44	2766	36	101
202/3-1 1642.50 m	Zircon_Sample-077	737	280	0.20	9.47	0.52	0.380	0.017	0.81	0.181	0.006	2385	50	2076	78	2661	54	78
202/3-1 1642.50 m	Zircon_Sample-079	118	64	0.48	14.57	1.19	0.542	0.023	0.52	0.195	0.014	2787	78	2792	95	2784	114	100
202/3-1 1642.50 m	Zircon_Sample-080	428	94	1.36	6.01	0.77	0.220	0.028	0.99	0.199	0.003	1978	112	1279	147	2816	29	45
202/3-1 1642.50 m	Zircon_Sample-081	273	146	1.04	14.15	0.89	0.535	0.023	0.67	0.192	0.009	2760	60	2764	95	2757	76	100
202/3-1 1642.50 m	Zircon_Sample-085	352	153	1.28	11.54	0.84	0.434	0.031	0.97	0.193	0.004	2568	68	2324	137	2766	30	84
202/3-1 1642.50 m	Zircon_Sample-087	202	109	0.44	14.67	0.69	0.540	0.015	0.60	0.197	0.007	2794	44	2785	64	2800	61	99
202/3-1 1642.50 m	Zircon_Sample-088	443	153	0.91	9.50	0.57	0.346	0.019	0.93	0.199	0.005	2388	56	1914	93	2821	37	68
202/3-1 1642.50 m	Zircon_Sample-089	2076	139	0.30	1.59	0.17	0.067	0.007	0.96	0.172	0.005	964	66	418	41	2573	49	16
202/3-1 1642.50 m	Zircon_Sample-090	146	74	1.27	13.28	0.75	0.510	0.026	0.88	0.189	0.005	2700	54	2656	109	2732	44	97
202/3-1 1642.50 m	Zircon_Sample-091	38	20	1.72	13.87	0.32	0.532	0.007	0.57	0.189	0.004	2741	22	2748	29	2736	31	100
202/3-1 1642.50 m	Zircon_Sample-092	86	45	0.36	13.66	0.87	0.525	0.024	0.72	0.189	0.008	2726	60	2720	101	2731	73	100
202/3-1 1642.50 m	Zircon_Sample-093	723	326	0.83	12.22	0.67	0.451	0.012	0.49	0.196	0.009	2621	51	2400	54	2797	78	86
202/3-1 1642.50 m	Zircon_Sample-094	32	17	6.50	15.00	0.95	0.548	0.013	0.37	0.199	0.012	2816	60	2815	53	2816	96	100
202/3-1 1642.50 m	Zircon_Sample-098	158	75	0.98	12.30	0.37	0.474	0.010	0.72	0.188	0.004	2628	28	2500	45	2727	34	92
202/3-1 1642.50 m	Zircon_Sample-099	121	65	0.71	14.05	0.43	0.539	0.008	0.51	0.189	0.005	2753	29	2781	35	2733	43	102
202/3-1 1642.50 m	Zircon_Sample-100	39	21	0.95	14.58	0.38	0.540	0.012	0.83	0.196	0.003	2788	25	2783	49	2792	24	100
202/3-1 1642.50 m	Zircon_Sample-101	211	111	0.11	13.64	0.37	0.526	0.008	0.59	0.188	0.004	2725	26	2722	36	2727	36	100
202/3-1 1642.50 m	Zircon_Sample-104	1231	333	0.77	7.02	0.21	0.270	0.005	0.55	0.189	0.005	2115	27	1541	23	2730	42	56
202/3-1 1642.50 m	Zircon_Sample-105	125	67	0.59	14.24	0.84	0.533	0.024	0.77	0.194	0.007	2766	56	2755	102	2774	62	99
202/3-1 1642.50 m	Zircon_Sample-106	2319	386	0.11	3.80	0.29	0.167	0.012	0.93	0.165	0.005	1592	61	994	65	2510	48	40
202/3-1 1642.50 m	Zircon_Sample-107	255	137	0.34	13.94	0.39	0.538	0.012	0.80	0.188	0.003	2745	26	2775	50	2724	28	102
202/3-1 1642.50 m	Zircon_Sample-111	195	82	0.21	11.20	0.41	0.423	0.012	0.80	0.192	0.004	2540	34	2274	57	2760	36	82
202/3-1 1642.50 m	Zircon_Sample-112	432	210	0.72	12.82	0.53	0.486	0.014	0.68	0.191	0.006	2666	39	2554	59	2752	49	93
202/3-1 1642.50 m	Zircon_Sample-113	283	158	0.44	14.69	0.54	0.558	0.009	0.43	0.191	0.006	2795	35	2857	36	2751	54	104
202/3-1 1642.50 m	Zircon_Sample-114	56	15	0.72	3.58	0.12	0.270	0.004	0.48	0.096	0.003	1545	26	1540	22	1551	54	99
202/3-1 1642.50 m	Zircon_Sample-115	139	75	1.10	14.06	0.62	0.536	0.017	0.72	0.190	0.006	2754	42	2767	72	2744	50	101
202/3-1 1642.50 m	Zircon_Sample-116	2325	173	0.19	1.89	0.07	0.074	0.002	0.68	0.184	0.005	1076	26	462	12	2691	48	17
202/3-1 1642.50 m	Zircon_Sample-117	95	35	1.20	7.89	0.57	0.366	0.010	0.39	0.156	0.010	2218	65	2010	49	2416	113	83
202/3-1 1642.50 m	Zircon_Sample-118	117	60	1.15	13.47	0.68	0.517	0.015	0.59	0.189	0.008	2713	48	2687	65	2733	67	98
202/3-1 1642.50 m	Zircon_Sample-119	265	130	0.10	12.92	0.72	0.490	0.023	0.84	0.191	0.006	2673	52	2571	99	2752	49	93
202/3-1 1642.50 m	Zircon_Sample-120	45	24	1.21	13.99	0.44	0.531	0.010	0.60	0.191	0.005	2749	30	2744	43	2753	41	100
202/3-1 1642.50 m	Zircon_Sample-124	161	85	2.79	13.50	0.50	0.524	0.012	0.62	0.187	0.005	2715	35	2716	51	2715	48	100
202/3-1 1642.50 m	Zircon_Sample-125	234	128	0.82	14.54	0.36	0.547	0.010	0.71	0.193	0.003	2786	24	2811	40	2768	29	102
202/3-1 1642.50 m	Zircon_Sample-126	123	67	0.56	14.25	0.58	0.540	0.016	0.73	0.192	0.005	2766	38	2782	67	2755	45	101
202/3-1 1642.50 m	Zircon_Sample-127	105	57	1.60	14.86	0.49	0.543	0.013	0.72	0.198	0.005	2806	32	2796	54	2814	38	99
202/3-1 1642.50 m	Zircon_Sample-128	1345	237	0.76	4.54	0.15	0.176	0.004	0.75	0.187	0.004	1737	27	1046	24	2713	35	39
202/3-1 1642.50 m	Zircon_Sample-129	228	45	0.67	5.22	0.39	0.197	0.014	0.97	0.192	0.004	1856	64	1158	77	2764	31	42
202/3-1 1642.50 m	Zircon_Sample-130	521	160	0.14	7.45	0.46	0.306	0.017	0.91	0.176	0.004	2167	56	1723	86	2619	42	66
202/3-1 1642.50 m	Zircon_Sample-131	152	82	0.63	14.58	0.69	0.539	0.019	0.74	0.196	0.006	2788	45	2779	79	2795	52	99
202/3-1 1642.50 m	Zircon_Sample-132	790	151	0.56	4.97	0.22	0.191	0.007	0.78	0.188	0.005	1815	38	1129	36	2727	46	41
202/3-1 1642.50 m	Zircon_Sample-133	312	162	0.43	13.37	0.53	0.520	0.017	0.83	0.187	0.004	2706	37	2698	72	2712	36	100
202/3-1 1642.50 m	Zircon_Sample-138	712	179	1.01	6.43	0.49	0.251	0.014	0.76	0.186	0.009	2037	67	1442	75	2708	81	53
202/3-1 1642.50 m	Zircon_Sample-139	293	42	0.10	1.87	0.10	0.145	0.004	0.55	0.094	0.004	1070	36	871	24	1503	85	58
202/3-1 1642.50 m	Zircon_Sample-140	54	31	1.01	15.82	0.70	0.581	0.009	0.34	0.197	0.008	2866	42	2953	36	2805	68	105
202/3-1 1642.50 m	Zircon_Sample-141	3918	43	0.14	0.16	0.02	0.011	0.001	0.88	0.106	0.005	151	14	70	6	1725	89	4
202/3-1 1642.50 m	Zircon_Sample-142	497	40	0.69	0.63	0.03	0.080	0.002	0.47	0.057	0.002	495	19	494	11	503	93	98
202/3-1 1642.50 m	Zircon_Sample-143	52	28	0.38	14.33	0.89	0.541	0.026	0.77	0.192	0.008	2772	59	2787	108	2760	66	101
202/3-1 1642.50 m	Zircon_Sample-144	238	131	0.98	14.96	1.03	0.549	0.016	0.42	0.198	0.012	2813	66	2822	67	2806	102	101
202/3-1 1642.50 m	Zircon_Sample-145	240	128	0.70	14.02	0.54	0.532	0.014	0.67	0.191	0.005	2751	36	2748	58	2753	47	100
202/3-1 1642.50 m	Zircon_Sample-146	701	227	0.28	7.85	0.43	0.323	0.014	0.76	0.176	0.006	2214	50	1806	66	2616	60	69
202/3-1 1642.50 m	Zircon_Sample-150	646	99	1.28	3.93	0.18	0.154	0.006	0.93	0.185	0.003	1619	36	922	36	2700	28	34
202/3-1 1642.50 m	Zircon_Sample-151	105	57	0.28	14.79	0.70	0.545	0.012	0.48	0.197	0.008	2802	45	2804	51	2800	68	100
202/3-1 1642.50 m	Zircon_Sample-152	140	75	0.50	14.25	0.66	0.536	0.014	0.58	0.193	0.007	2766	44	2768	61	2765	62	100
202/3-1 1642.50 m	Zircon_Sample-153	48	25	1.06	13.72	0.74	0.527	0.019	0.68	0.189	0.008	2731	51	2727	82	2733	65	100
202/3-1 1642.50 m	Zircon_Sample-154	88	57	0.78	21.54	0.99	0.650	0.015	0.51	0.240	0.010	3163	45	3230	60	3121	63	103

[a] U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b] Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using $(^{207}Pb/^{206}Pb)/(^{238}U/^{206}Pb * 1/137.88)$

[c] Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d] Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e] Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

					RATIOS							AGES [Ma]						Conc.
Sample	Analysis	U [ppm][a]	Pb [ppm][a]	Th/U[a]	$^{207}Pb/^{235}U$[b]	2 σ[d]	$^{206}Pb/^{238}U$[b]	2 σ[d]	rho[c]	$^{207}Pb/^{206}Pb$[e]	2 σ[d]	$^{207}Pb/^{235}U$	2 σ	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	%
206/4-1 4115 m	Zircon_sample-007	203	106	0.77	13.66	0.52	0.524	0.016	0.79	0.189	0.004	2727	36	2715	67	2735	39	99
206/4-1 4115 m	Zircon_sample-009	519	266	0.90	12.92	0.53	0.512	0.019	0.89	0.183	0.003	2674	39	2667	79	2679	31	100
206/4-1 4115 m	Zircon_sample-011	97	51	0.84	13.64	0.40	0.521	0.009	0.59	0.190	0.005	2725	28	2704	39	2741	39	99
206/4-1 4115 m	Zircon_sample-012	128	68	1.04	13.84	0.40	0.533	0.011	0.70	0.188	0.004	2739	27	2755	45	2728	34	101
206/4-1 4115 m	Zircon_sample-013	326	183	0.40	14.44	0.29	0.561	0.006	0.54	0.187	0.003	2779	19	2870	25	2713	28	106
206/4-1 4115 m	Zircon_sample-014	257	136	0.61	13.63	0.32	0.527	0.008	0.64	0.188	0.003	2725	22	2729	33	2721	30	100
206/4-1 4115 m	Zircon_sample-015	749	392	0.39	13.27	0.23	0.524	0.007	0.75	0.184	0.002	2699	17	2714	29	2687	19	101
206/4-1 4115 m	Zircon_sample-016	894	480	0.18	14.14	1.06	0.537	0.024	0.60	0.191	0.011	2759	72	2771	102	2751	99	101
206/4-1 4115 m	Zircon_sample-020	881	478	0.88	14.28	0.56	0.543	0.014	0.66	0.191	0.006	2769	37	2794	58	2750	48	102
206/4-1 4115 m	Zircon_sample-021	121	65	1.18	14.06	0.37	0.540	0.011	0.74	0.189	0.003	2754	25	2783	44	2732	29	102
206/4-1 4115 m	Zircon_sample-022	447	236	0.89	13.38	0.30	0.528	0.008	0.66	0.184	0.003	2707	21	2732	33	2688	28	102
206/4-1 4115 m	Zircon_sample-024	362	192	0.25	13.52	0.41	0.529	0.008	0.48	0.185	0.005	2717	29	2736	33	2702	44	101
206/4-1 4115 m	Zircon_sample-025	179	96	0.74	13.92	0.30	0.538	0.006	0.52	0.188	0.003	2744	20	2773	25	2723	30	102
206/4-1 4115 m	Zircon_sample-026	783	400	0.69	12.99	0.63	0.510	0.013	0.54	0.185	0.007	2679	46	2658	57	2694	67	99
206/4-1 4115 m	Zircon_sample-028	201	108	0.83	13.96	0.33	0.537	0.007	0.55	0.189	0.004	2747	22	2770	29	2730	32	101
206/4-1 4115 m	Zircon_sample-029	186	98	0.48	13.50	0.21	0.524	0.005	0.64	0.187	0.002	2715	15	2716	22	2714	20	100
206/4-1 4115 m	Zircon_sample-033	477	231	0.60	12.33	0.30	0.484	0.002	0.19	0.185	0.004	2630	23	2543	10	2697	40	94
206/4-1 4115 m	Zircon_sample-034	839	435	0.50	12.90	0.58	0.519	0.016	0.68	0.180	0.006	2673	42	2694	67	2657	54	101
206/4-1 4115 m	Zircon_sample-036	169	90	0.63	13.96	0.39	0.533	0.013	0.91	0.190	0.002	2747	26	2755	56	2741	19	100
206/4-1 4115 m	Zircon_sample-037	240	129	0.49	13.98	0.26	0.537	0.005	0.45	0.189	0.003	2749	18	2773	19	2731	28	102
206/4-1 4115 m	Zircon_sample-038	215	114	0.51	13.73	0.30	0.532	0.005	0.44	0.187	0.004	2731	20	2750	21	2718	32	101
206/4-1 4115 m	Zircon_sample-039	351	196	0.68	14.27	0.26	0.559	0.008	0.76	0.185	0.002	2768	17	2864	32	2698	20	106
206/4-1 4115 m	Zircon_sample-040	987	505	0.35	12.88	0.64	0.511	0.024	0.94	0.183	0.003	2671	47	2662	102	2677	28	99
206/4-1 4115 m	Zircon_sample-046	203	111	0.39	14.11	0.30	0.545	0.008	0.67	0.188	0.003	2757	20	2805	32	2722	26	103
206/4-1 4115 m	Zircon_Sample-047	400	211	0.41	13.80	0.38	0.526	0.013	0.88	0.190	0.003	2736	26	2725	54	2744	22	99
206/4-1 4115 m	Zircon_Sample-050	601	326	0.83	13.60	0.23	0.542	0.006	0.67	0.182	0.002	2722	16	2793	26	2671	21	105
206/4-1 4115 m	Zircon_Sample-051	131	71	1.90	14.17	0.25	0.541	0.005	0.51	0.190	0.003	2761	17	2789	20	2741	25	102
206/4-1 4115 m	Zircon_Sample-052	157	84	0.62	13.99	0.33	0.537	0.010	0.76	0.189	0.003	2749	22	2771	40	2733	25	101
206/4-1 4115 m	Zircon_Sample-053	312	138	0.81	11.30	0.39	0.442	0.012	0.77	0.186	0.004	2548	32	2358	53	2703	37	87
206/4-1 4115 m	Zircon_Sample-054	282	148	1.12	13.54	0.20	0.525	0.005	0.68	0.187	0.002	2718	14	2721	22	2717	18	100
206/4-1 4115 m	Zircon_Sample-055	202	105	0.65	13.62	0.28	0.521	0.006	0.61	0.190	0.003	2724	19	2702	27	2740	27	99
206/4-1 4115 m	Zircon_Sample-059	179	94	0.95	13.72	0.32	0.525	0.008	0.65	0.189	0.003	2730	22	2722	34	2736	30	99
206/4-1 4115 m	Zircon_Sample-060	1379	511	0.59	9.42	0.26	0.370	0.009	0.91	0.185	0.002	2380	25	2030	43	2694	19	75
206/4-1 4115 m	Zircon_Sample-061	573	315	0.33	14.09	0.22	0.549	0.006	0.72	0.186	0.002	2756	15	2821	25	2708	18	104
206/4-1 4115 m	Zircon_Sample-062	61	32	0.81	13.48	0.36	0.525	0.008	0.53	0.186	0.004	2714	25	2720	32	2709	38	100
206/4-1 4115 m	Zircon_Sample-063	113	61	1.06	14.45	0.45	0.541	0.010	0.61	0.194	0.005	2779	30	2787	43	2774	41	100
206/4-1 4115 m	Zircon_Sample-064	125	71	1.47	14.82	0.19	0.565	0.005	0.74	0.190	0.002	2804	12	2889	22	2743	14	105
206/4-1 4115 m	Zircon_Sample-065	110	59	0.95	13.98	0.45	0.534	0.010	0.57	0.190	0.005	2748	30	2758	41	2741	43	101
206/4-1 4115 m	Zircon_Sample-066	203	108	1.51	13.96	0.30	0.532	0.008	0.70	0.190	0.003	2747	20	2751	33	2744	25	100
206/4-1 4115 m	Zircon_Sample-067	1865	1082	0.17	17.32	2.25	0.580	0.029	0.39	0.217	0.026	2953	126	2948	120	2956	193	100
206/4-1 4115 m	Zircon_Sample-068	195	104	1.87	13.91	0.53	0.534	0.012	0.61	0.189	0.006	2743	36	2759	52	2732	50	101
206/4-1 4115 m	Zircon_Sample-072	82	44	1.60	14.30	0.40	0.535	0.010	0.65	0.194	0.004	2770	27	2764	41	2774	35	100
206/4-1 4115 m	Zircon_Sample-073	175	89	0.56	12.91	0.31	0.508	0.008	0.62	0.184	0.004	2673	23	2647	32	2693	31	98
206/4-1 4115 m	Zircon_Sample-074	1074	472	0.63	10.93	0.16	0.440	0.005	0.78	0.180	0.002	2517	13	2349	22	2656	15	88
206/4-1 4115 m	Zircon_Sample-075	128	70	1.92	14.46	0.22	0.545	0.005	0.60	0.192	0.002	2780	15	2803	21	2764	20	101
206/4-1 4115 m	Zircon_Sample-076	266	138	0.58	13.22	0.30	0.517	0.009	0.76	0.185	0.003	2696	21	2688	37	2701	24	100
206/4-1 4115 m	Zircon_Sample-078	137	71	1.65	13.15	0.60	0.519	0.019	0.80	0.184	0.005	2690	43	2696	81	2686	45	100
206/4-1 4115 m	Zircon_Sample-079	257	133	0.54	13.31	0.43	0.518	0.006	0.38	0.186	0.006	2702	31	2693	27	2708	50	99
206/4-1 4115 m	Zircon_Sample-080	118	63	1.32	14.00	0.45	0.533	0.014	0.82	0.190	0.003	2750	30	2755	59	2746	30	100
206/4-1 4115 m	Zircon_Sample-081	1057	559	0.24	13.25	0.30	0.530	0.009	0.79	0.181	0.003	2697	21	2739	40	2666	23	103
206/4-1 4115 m	Zircon_Sample-085	152	79	0.83	13.42	0.42	0.522	0.009	0.52	0.186	0.005	2710	30	2709	36	2711	45	100
206/4-1 4115 m	Zircon_Sample-086	110	57	1.20	13.56	0.46	0.519	0.014	0.80	0.189	0.004	2719	32	2695	59	2738	33	98
206/4-1 4115 m	Zircon_Sample-087	1423	675	0.66	13.75	1.17	0.474	0.023	0.56	0.210	0.015	2733	81	2502	98	2908	115	86
206/4-1 4115 m	Zircon_Sample-088	236	123	1.34	13.49	0.28	0.522	0.007	0.66	0.187	0.003	2715	19	2709	30	2719	25	100
206/4-1 4115 m	Zircon_Sample-090	1345	567	0.53	10.85	0.44	0.422	0.015	0.90	0.187	0.003	2510	38	2269	70	2712	30	84
206/4-1 4115 m	Zircon_Sample-091	29	16	1.97	13.40	0.52	0.531	0.016	0.78	0.183	0.004	2708	36	2746	67	2680	40	102
206/4-1 4115 m	Zircon_Sample-093	378	201	0.36	13.59	0.35	0.531	0.009	0.68	0.186	0.003	2722	24	2745	39	2705	31	101
206/4-1 4115 m	Zircon_Sample-098	439	239	0.23	14.15	0.25	0.545	0.007	0.76	0.188	0.002	2760	17	2803	30	2728	19	103
206/4-1 4115 m	Zircon_Sample-099	103	55	1.07	14.03	0.30	0.535	0.009	0.80	0.190	0.002	2751	20	2763	39	2743	21	101
206/4-1 4115 m	Zircon_Sample-100	121	65	1.34	13.97	0.54	0.538	0.012	0.57	0.188	0.006	2748	36	2774	50	2729	52	102
206/4-1 4115 m	Zircon_Sample-101	771	413	0.65	13.91	0.32	0.535	0.008	0.66	0.189	0.003	2743	22	2762	34	2730	28	101
206/4-1 4115 m	Zircon_Sample-103	109	60	1.17	14.16	0.29	0.545	0.008	0.74	0.189	0.003	2761	20	2804	35	2729	23	103
206/4-1 4115 m	Zircon_Sample-104	622	330	0.24	13.57	0.32	0.531	0.009	0.70	0.185	0.003	2720	22	2746	36	2701	28	102
206/4-1 4115 m	Zircon_Sample-105	2743	908	0.15	7.85	0.50	0.331	0.020	0.96	0.172	0.003	2214	58	1843	98	2577	31	71
206/4-1 4115 m	Zircon_Sample-106	466	288	0.75	19.21	0.45	0.617	0.005	0.38	0.226	0.005	3052	23	3099	22	3022	35	103
206/4-1 4115 m	Zircon_Sample-107	976	519	0.15	13.69	0.19	0.532	0.004	0.59	0.187	0.002	2728	13	2748	19	2714	19	101
206/4-1 4115 m	Zircon_Sample-111	691	338	0.87	12.74	0.28	0.489	0.006	0.57	0.189	0.003	2660	21	2566	26	2733	30	94
206/4-1 4115 m	Zircon_Sample-112	3701	738	0.17	4.84	0.21	0.199	0.009	0.98	0.176	0.002	1792	37	1173	46	2616	15	45
206/4-1 4115 m	Zircon_Sample-113	1444	656	0.51	11.47	0.28	0.455	0.006	0.56	0.183	0.004	2562	23	2415	28	2681	33	90
206/4-1 4115 m	Zircon_Sample-114	2785	1011	0.24	8.66	0.46	0.363	0.017	0.86	0.173	0.005	2303	48	1996	79	2588	45	77
206/4-1 4115 m	Zircon_Sample-115	619	259	0.68	10.66	0.31	0.418	0.011	0.87	0.185	0.003	2494	27	2250	49	2698	23	83
206/4-1 4115 m	Zircon_Sample-116	994	434	1.43	10.99	0.24	0.437	0.009	0.96	0.183	0.001	2522	20	2335	41	2676	10	87
206/4-1 4115 m	Zircon_Sample-117	2605	518	0.07	4.88	0.10	0.199	0.003	0.76	0.178	0.002	1799	18	1169	17	2636	23	44
206/4-1 4115 m	Zircon_Sample-118	445	231	0.55	13.23	0.26	0.519	0.008	0.84	0.185	0.002	2696	18	2694	36	2698	18	100
206/4-1 4115 m	Zircon_Sample-119	325	181	0.74	14.39	0.23	0.558	0.006	0.69	0.187	0.002	2776	15	2860	25	2715	19	105
206/4-1 4115 m	Zircon_Sample-120	308	164	1.07	13.66	0.15	0.532	0.003	0.43	0.186	0.002	2727	11	2749	11	2710	17	101
206/4-1 4115 m	Zircon_Sample-124	239	121	0.55	13.14	0.22	0.505	0.006	0.66	0.189	0.002	2690	16	2634	24	2732	21	96
206/4-1 4115 m	Zircon_Sample-125	447	230	0.44	13.03	0.23	0.514	0.006	0.71	0.184	0.002	2682	16	2676	27	2686	20	100
206/4-1 4115 m	Zircon_Sample-126	571	313	0.50	14.40	0.20	0.547	0.005	0.59	0.191	0.002	2776	13	2815	19	2749	19	102
206/4-1 4115 m	Zircon_Sample-127	126	38	0.51	4.32	0.14	0.302	0.003	0.35	0.104	0.003	1698	26	1703	16	1692	55	101
206/4-1 4115 m	Zircon_Sample-128	924	401	0.62	11.04	0.59	0.434	0.022	0.94	0.185	0.003	2526	50	2323	98	2694	30	86
206/4-1 4115 m	Zircon_Sample-129	390	216	0.59	14.29	0.20	0.554	0.005	0.61	0.187	0.002	2769	13	2842	19	2716	18	105
206/4-1 4115 m	Zircon_Sample-130	1248	422	0.24	8.71	0.23	0.338	0.007	0.81	0.187	0.003	2308	25	1877	36	2715	26	69
206/4-1 4115 m	Zircon_Sample-131	518	266	0.49	13.13	0.23	0.513	0.007	0.78	0.186	0.002	2689	16	2670	30	2703	18	99
206/4-1 4115 m	Zircon_Sample-132	900	428	0.46	12.05	0.47	0.475	0.018	0.97	0.184	0.002	2609	37	2507	79	2688	15	93
206/4-1 4115 m	Zircon_Sample-133	358	195	0.16	14.03	0.20	0.544	0.006	0.80	0.187	0.002	2752	13	2801	25	2716	14	103
206/4-1 4115 m	Zircon_Sample-137	829	503	0.54	18.61	0.47	0.607	0.013	0.86	0.222	0.003	3022	24	3059	53	2998	21	102
206/4-1 4115 m	Zircon_Sample-138	444	226	0.43	13.14	0.26	0.508	0.007	0.72	0.187	0.003	2690	19	2650	31	2719	23	97
206/4-1 4115 m	Zircon_Sample-139	561	282	0.20	12.89	0.30	0.503	0.008	0.71	0.186	0.003	2672	22	2625	35	2708	27	97
206/4-1 4115 m	Zircon_Sample-140	984	512	0.49	13.30	0.67	0.520	0.026	0.99	0.185	0.002	2701	48	2701	110	2701	14	100
206/4-1 4115 m	Zircon_Sample-142	861	389	0.32	11.64	0.28	0.452	0.004	0.39	0.187	0.004	2576	22	2406	19	2713	36	89
206/4-1 4115 m	Zircon_Sample-143	263	140	0.87	13.74	0.23	0.531	0.006	0.67	0.188	0.002	2732	16	2747	25	2720	21	101
206/4-1 4115 m	Zircon_Sample-144	1480	417	0.38	7.24	0.22	0.282	0.008	0.98	0.186	0.001	2141	27	1600	42	2709	9	59
206/4-1 4115 m	Zircon_Sample-145	310	151	0.55	12.48	0.26	0.485	0.007	0.73	0.186	0.003	2641	19	2551	31	2711	23	94
206/4-1 4115 m	Zircon_Sample-146	381	207	0.88	13.85	0.21	0.542	0.005	0.64	0.185	0.002	2740	15	2793	22	2700	20	103
206/4-1 4115 m	Zircon_Sample-150	145	82	1.47	14.87	0.30	0.566	0.007	0.59	0.190	0.003	2807	19	2892	28	2746	27	105
206/4-1 4115 m	Zircon_Sample-151	147	78	2.14	13.99	0.22	0.532	0.005	0.60	0.191	0.002	2749	15	2751	21	2747	21	100
206/4-1 4115 m	Zircon_Sample-152	192	100	0.69	13.60	0.32	0.521	0.008	0.66	0.189	0.003	2723	22	2705	34	2735	29	99
206/4-1 4115 m	Zircon_Sample-153	880	467	0.08	13.77	0.28	0.530	0.008	0.72	0.188	0.003	2734	20	2744	33	2727	24	101
206/4-1 4115 m	Zircon_Sample-154	786	383	0.72	12.42	1.05	0.488	0.040	0.98	0.185	0.003	2637	80	2560	175	2696	28	95

[a] U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b] Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using $(^{207}Pb/^{206}Pb)/(^{238}U/^{206}Pb * 1/137.88)$

[c] Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d] Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e] Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

Supplementary files #3 - Basement Lu-Hf Data

LA-MC-ICPMS Lu-Hf isotope data of zircon from basement samples west of Shetland

lab number	$^{176}Yb/^{177}Hf$	±2σ	$^{176}Lu/^{177}Hf$ [a]	±2σ	$^{178}Hf/^{177}Hf$	$^{180}Hf/^{177}Hf$	Sig_{Hf} [b] (V)	$^{176}Hf/^{177}Hf$	±2σ [c]	$^{176}Hf/^{177}Hf_{(t)}$ [d]	εHf(t) [d]	±2σ [c]	T_{DM} [e] (Ga)	age [f] (Ma)	±2σ
11686_86	0.0125	11	0.00042	3	1.46719	1.88692	15	0.281069	23	0.281048	0.9	0.8	2.89	2739	31
11686_87	0.0097	8	0.00033	2	1.46715	1.88657	14	0.281060	27	0.281043	0.6	1.0	2.90	2732	36
11686_89	0.0191	25	0.00064	7	1.46721	1.88687	13	0.281097	18	0.281063	1.3	0.6	2.87	2731	29
11686_90	0.0168	14	0.00056	4	1.46715	1.88670	12	0.281076	28	0.281046	1.1	1.0	2.89	2749	31
11686_92	0.0157	13	0.00050	3	1.46720	1.88689	29	0.281095	15	0.281069	1.5	0.5	2.85	2732	32
11686_93	0.0112	9	0.00039	2	1.46724	1.88670	36	0.281082	28	0.281062	1.1	1.0	2.87	2723	28
11686_94	0.0165	13	0.00054	3	1.46717	1.88687	31	0.281085	18	0.281057	0.6	0.6	2.89	2712	29
11686_98	0.0160	14	0.00052	4	1.46719	1.88677	27	0.281094	19	0.281067	1.7	0.7	2.85	2743	35
11686_100	0.0125	11	0.00044	3	1.46716	1.88658	25	0.281069	23	0.281047	0.7	0.8	2.90	2731	27
11686_101	0.0115	9	0.00038	2	1.46718	1.88679	30	0.281068	28	0.281048	0.8	1.0	2.89	2733	32
11686_102	0.0096	8	0.00031	2	1.46723	1.88681	26	0.281078	16	0.281060	4.0	0.6	2.81	2852	101
11686_103	0.0130	12	0.00041	3	1.46720	1.88685	13	0.281096	21	0.281075	1.7	0.7	2.84	2730	36
11686_104	0.0124	10	0.00039	2	1.46718	1.88678	13	0.281078	21	0.281057	0.9	0.7	2.88	2726	33
11686_106	0.0094	8	0.00033	2	1.46717	1.88677	27	0.281062	19	0.281045	0.2	0.7	2.91	2715	32
11686_107	0.0152	13	0.00049	3	1.46721	1.88671	29	0.281091	17	0.281066	-0.3	0.6	2.90	2658	36
11686_111	0.0114	10	0.00039	3	1.46723	1.88694	15	0.281096	41	0.281076	1.5	1.4	2.84	2724	33
11686_113	0.0149	12	0.00050	3	1.46713	1.88662	14	0.281070	24	0.281044	1.0	0.8	2.90	2746	34
11691-48	0.0127	13	0.00048	4	1.46725	1.88682	16	0.281049	17	0.281024	0.0	0.6	2.94	2738	24
11691-50	0.0366	60	0.00129	19	1.46730	1.88683	13	0.281091	23	0.281024	0.0	0.8	2.94	2737	30
11691-51	0.0286	26	0.00102	7	1.46724	1.88672	16	0.281082	21	0.281029	-0.1	0.8	2.94	2722	24
11691-55	0.0084	8	0.00032	2	1.46725	1.88684	17	0.281027	17	0.281010	-0.9	0.6	2.98	2717	30
11691-59	0.0108	9	0.00043	3	1.46731	1.88681	19	0.281030	19	0.281007	-0.1	0.7	2.96	2757	26
11691-60	0.0178	17	0.00070	6	1.46727	1.88692	18	0.281056	19	0.281019	-0.4	0.7	2.95	2728	27
11691-62	0.0176	17	0.00062	5	1.46732	1.88676	18	0.281044	18	0.281012	-0.9	0.6	2.97	2716	26
11691-63	0.0169	18	0.00063	6	1.46726	1.88690	17	0.281042	17	0.281009	-0.7	0.6	2.97	2729	37
11691-64	0.0111	9	0.00039	2	1.46731	1.88689	16	0.281038	16	0.281017	-0.9	0.6	2.97	2709	29
11691-66	0.0274	27	0.00104	8	1.46726	1.88679	19	0.281065	17	0.281011	-0.8	0.6	2.97	2723	26
11691-72	0.0266	22	0.00093	6	1.46729	1.88675	14	0.281054	22	0.281005	-0.6	0.8	2.98	2738	27
11691-73	0.0067	6	0.00024	2	1.46731	1.88670	15	0.281042	23	0.281029	0.1	0.8	2.93	2735	36
11694-14	0.0155	13	0.00062	4	1.46725	1.88683	38	0.280935	12	0.280903	-3.6	0.4	3.16	2767	20
11694-24	0.0116	12	0.00041	3	1.46721	1.88688	33	0.280930	12	0.280909	-3.7	0.4	3.16	2751	27
11694-25	0.0122	10	0.00043	3	1.46723	1.88683	27	0.280957	13	0.280934	-2.3	0.5	3.10	2774	37
11694-26	0.0076	6	0.00027	2	1.46724	1.88676	29	0.280922	16	0.280908	-3.3	0.6	3.15	2772	26
11694-28	0.0129	10	0.00045	3	1.46728	1.88691	31	0.280922	12	0.280897	-1.5	0.4	3.13	2865	20
11694-29	0.0078	6	0.00027	2	1.46731	1.88683	27	0.280919	13	0.280905	-4.6	0.5	3.18	2722	27
11694-37	0.0099	8	0.00035	2	1.46726	1.88687	25	0.280955	18	0.280937	-3.6	0.6	3.12	2714	43
11694-38	0.0098	8	0.00035	2	1.46721	1.88698	31	0.280923	13	0.280904	-3.1	0.5	3.15	2786	31
11694-39	0.0183	16	0.00060	4	1.46723	1.88678	35	0.280961	14	0.280929	-3.2	0.5	3.12	2745	24
11694-46	0.0165	16	0.00056	4	1.46724	1.88658	14	0.281050	18	0.281020	-0.1	0.6	2.95	2737	31
11694-50	0.0106	9	0.00037	2	1.46727	1.88670	16	0.280941	18	0.280921	-3.6	0.6	3.14	2738	30
11694-51	0.0115	10	0.00041	3	1.46715	1.88696	30	0.280932	16	0.280911	-4.7	0.6	3.18	2708	42
11694-53	0.0154	14	0.00053	4	1.46719	1.88687	24	0.280968	14	0.280940	-3.5	0.5	3.11	2715	46
11694-54	0.0100	11	0.00035	3	1.46727	1.88664	15	0.280960	19	0.280942	-2.7	0.7	3.10	2747	39
11694-63	0.0078	7	0.00028	2	1.46726	1.88681	13	0.280938	18	0.280923	-3.5	0.6	3.14	2741	32
11694-74	0.0085	7	0.00030	2	1.46726	1.88676	14	0.280951	19	0.280935	-3.3	0.7	3.12	2732	29
11694-80	0.0092	8	0.00033	2	1.46717	1.88689	10	0.280961	24	0.280944	-2.0	0.9	3.08	2773	55
11694-81	0.0137	12	0.00047	3	1.46733	1.88673	17	0.280940	17	0.280916	-3.8	0.6	3.15	2737	33
11694-87	0.0079	6	0.00028	2	1.46717	1.88665	15	0.280957	19	0.280942	-3.2	0.7	3.11	2722	35
11698-7	0.0364	31	0.00105	7	1.46729	1.88687	17	0.280927	18	0.280871	-4.1	0.7	3.21	2795	22
11698-13	0.0166	14	0.00051	3	1.46731	1.88673	19	0.280908	20	0.280880	-4.5	0.7	3.21	2760	26
11698-14	0.0120	11	0.00041	3	1.46733	1.88670	19	0.280888	18	0.280866	-3.6	0.6	3.21	2822	21
11698-16	0.0113	9	0.00039	2	1.46730	1.88685	18	0.280913	17	0.280893	-4.7	0.6	3.20	2736	26
11698-20	0.0189	15	0.00063	4	1.46728	1.88678	17	0.280913	20	0.280879	-3.4	0.7	3.19	2809	22
11698-21	0.0493	46	0.00128	10	1.46726	1.88669	19	0.280959	18	0.280891	-3.7	0.6	3.18	2779	23
11698-22	0.0188	17	0.00055	3	1.46729	1.88680	20	0.280922	18	0.280893	-4.0	0.6	3.18	2764	26
11698-25	0.0117	10	0.00036	2	1.46715	1.88685	11	0.280922	26	0.280903	-4.0	0.9	3.17	2747	30
11698-26	0.0675	98	0.00173	23	1.46726	1.88680	22	0.280976	24	0.280884	-4.4	0.8	3.20	2762	24
11698-27	0.0115	9	0.00040	2	1.46730	1.88669	20	0.280912	14	0.280891	-3.9	0.5	3.19	2770	24
11698-28	0.0470	45	0.00147	11	1.46721	1.88700	17	0.280978	22	0.280900	-3.5	0.8	3.17	2774	25
11698-29	0.0125	10	0.00042	3	1.46728	1.88684	22	0.280921	15	0.280899	-3.8	0.5	3.17	2762	27
11698-33	0.0113	10	0.00040	3	1.46729	1.88671	21	0.280916	16	0.280895	-3.4	0.6	3.17	2786	26
11698-34	0.0130	12	0.00042	3	1.46730	1.88673	19	0.280921	16	0.280898	-3.5	0.6	3.17	2777	27
11698-35	0.0133	11	0.00043	3	1.46729	1.88683	19	0.280907	16	0.280884	-4.1	0.6	3.20	2774	29
11698-36	0.0249	23	0.00072	5	1.46727	1.88687	20	0.280906	16	0.280868	-4.7	0.6	3.23	2774	26
11700-7	0.0079	7	0.00028	2	1.46729	1.88685	15	0.280875	21	0.280860	-5.3	0.7	3.25	2759	32
11700-8	0.0102	8	0.00034	2	1.46715	1.88665	8	0.280893	29	0.280875	-5.5	1.0	3.24	2726	34
11700-9	0.0111	10	0.00037	3	1.46732	1.88654	13	0.280884	21	0.280864	-4.3	0.7	3.23	2795	23

11700-10	0.0087	7	0.00030	2	1.46733	1.88651	14	0.280878	22	0.280862	-5.5	0.8	3.25	2748	32
11700-11	0.0092	7	0.00031	2	1.46724	1.88665	14	0.280880	18	0.280863	-4.4	0.6	3.23	2794	23
11700-13	0.0093	11	0.00032	3	1.46715	1.88688	5	0.280886	36	0.280869	-4.7	1.3	3.23	2771	54
11700-14	0.0095	8	0.00033	2	1.46733	1.88652	11	0.280897	22	0.280879	-4.4	0.8	3.21	2766	26
11700-15	0.0125	12	0.00042	3	1.46728	1.88682	15	0.280900	21	0.280878	-4.8	0.7	3.22	2752	34
11700-20	0.0087	8	0.00031	2	1.46721	1.88663	3	0.281021	25	0.281005	0.4	0.9	2.96	2782	39
11700-21	0.2419	235	0.00555	42	1.46722	1.88675	20	0.280923	26	0.280636	-14.6	0.9	3.71	2703	24
11700-23	0.0109	9	0.00037	2	1.46716	1.88660	12	0.280884	24	0.280864	-4.1	0.9	3.22	2803	26
11700-25	0.0100	10	0.00033	2	1.46734	1.88656	15	0.280875	27	0.280857	-4.6	1.0	3.24	2792	64
11700-27	0.0095	9	0.00033	2	1.46715	1.88674	7	0.280873	30	0.280856	-5.4	1.1	3.26	2761	28
11700-36	0.0111	11	0.00037	3	1.46734	1.88688	12	0.280880	23	0.280860	-4.3	0.8	3.23	2803	29
11705-85	0.0154	13	0.00053	3	1.46725	1.88684	13	0.280966	19	0.280938	-2.5	0.7	3.10	2759	41
11705-87	0.0091	9	0.00036	3	1.46726	1.88678	17	0.280962	19	0.280944	-2.8	0.7	3.10	2740	26
11705-89	0.0096	8	0.00035	2	1.46728	1.88678	14	0.280971	16	0.280953	-2.5	0.6	3.08	2739	29
11705-90	0.0221	18	0.00081	5	1.46727	1.88680	17	0.281004	16	0.280962	-2.7	0.6	3.07	2713	23
11705-92	0.0207	21	0.00085	7	1.46727	1.88674	17	0.281010	16	0.280970	-8.0	0.6	3.17	2477	23
11705-93	0.0170	14	0.00067	4	1.46729	1.88690	18	0.281001	16	0.280967	-2.7	0.6	3.07	2707	30
11705-94	0.0093	8	0.00035	2	1.46728	1.88670	16	0.280960	19	0.280942	-2.5	0.7	3.09	2755	28
11705-98	0.0176	19	0.00061	6	1.46725	1.88670	14	0.281000	18	0.280967	-1.8	0.6	3.05	2744	33
11705-112	0.0090	8	0.00034	2	1.46733	1.88686	17	0.280975	17	0.280957	-2.0	0.6	3.06	2755	31
11705-116	0.0179	21	0.00069	7	1.46732	1.88681	16	0.280994	21	0.280958	-1.9	0.7	3.06	2755	32
11711-07	0.0172	15	0.00065	5	1.46728	1.88666	13	0.281050	18	0.281016	1.0	0.7	2.93	2791	39
11711-08	0.0148	12	0.00057	4	1.46726	1.88678	12	0.281055	19	0.281024	2.3	0.7	2.89	2833	36
11711-09	0.0173	15	0.00061	4	1.46720	1.88657	11	0.281078	20	0.281046	0.7	0.7	2.90	2733	36
11711-12	0.0206	20	0.00079	6	1.46731	1.88664	12	0.281072	22	0.281030	1.4	0.8	2.90	2786	36
11711-13	0.0143	12	0.00055	3	1.46724	1.88672	12	0.281045	22	0.281015	0.8	0.8	2.93	2786	34
11711-14	0.0170	15	0.00065	4	1.46732	1.88667	12	0.281066	21	0.281031	1.6	0.7	2.90	2793	35
11711-15	0.0126	13	0.00046	4	1.46715	1.88697	16	0.281053	25	0.281028	2.0	0.9	2.89	2814	35
11711-36	0.0127	11	0.00049	3	1.46717	1.88671	13	0.281034	23	0.281007	1.8	0.8	2.92	2836	57
11711-37	0.0177	22	0.00065	7	1.46724	1.88651	11	0.281051	25	0.281016	1.2	0.9	2.93	2799	45
11711-38	0.0155	15	0.00057	4	1.46714	1.88663	8	0.281076	24	0.281045	2.6	0.9	2.86	2815	59
11711-42	0.0122	10	0.00047	3	1.46718	1.88697	6	0.281053	27	0.281027	2.2	1.0	2.89	2827	55
Plesovice (n=7)	0.0055	32	0.00014	8	1.46730	1.88670	14	0.282476	20	0.282475	-3.4	0.7	1.17	338	3
GJ-1 (n=7)	0.0076	6	0.00026	0	1.46729	1.88671	9	0.282013	25	0.282010	-13.9	0.9	1.96	606	6
JMC 475 (n=6)					1.46719	1.88669	11	0.282149	8						

Quoted uncertainties (absolute) relate to the last quoted figure. The effect of the inter-element fractionation on the Lu/Hf was estimated to be about 6 % or less based on analyses of the GJ-1 and Plesoviče zircon. Accuracy and reproducibilty was checked by repeated analyses (n = 7) of reference zircon GJ-1 and Plesoviče (data given as mean with 2 standard deviation uncertainties)

(a) $^{176}Yb/^{177}Hf = (^{176}Yb/^{173}Yb)_{true} \times (^{173}Yb/^{177}Hf)_{meas} \times (M_{173(Yb)}/M_{177(Hf)})^{\beta(Hf)}$, $\beta(Hf) = \ln(^{179}Hf/^{177}Hf_{\ true} / {}^{179}Hf/^{177}Hf_{measured}) / \ln(M_{179(Hf)}/M_{177(Hf)})$, M=mass of respective isotope. The $^{176}Lu/^{177}Hf$ were calculated in a similar way by using the $^{175}Lu/^{177}Hf$.

(b) Mean Hf signal in volt.

(c) Uncertainties are quadratic additions of the within-run precision and the daily reproducibility of the 40ppb-JMC475 solution. Uncertainties for the JMC475 quoted at 2SD (2 standard deviation).

(d) Initial $^{176}Hf/^{177}Hf$ and εHf calculated using the apparent Pb-Pb age determined by LA-ICP-MS dating (see column f), and the CHUR parameters: $^{176}Lu/^{177}Hf = 0.0336$, and $^{176}Hf/^{177}Hf = 0.282785$ (Bouvier *et al*., 2008).

(e) two stage model age in billion years using the measured $^{176}Lu/^{177}Hf$ of each spot (first stage = age of zircon), a value of 0.0113 for the average continental crust (second stage), and a depleted mantle (DM<, Chauvel et al. 2008) $^{176}Lu/^{177}Hf$ and $^{176}Hf/^{177}Hf$ of 0.0384 and 0.28316, respectively.

(f) apparent Pb-Pb age determined by LA-ICP-MS

GJ1-28-90-100-6	0.0076	6	0.00026	2	1.46727	1.88681	6	0.282027	34	0.282024	-13.4	1.2	1.93	606	9
GJ1-33-90-100-6	0.0075	6	0.00026	2	1.46733	1.88663	6	0.282020	29	0.282017	-13.7	1.0	1.95	606	9
GJ1-33-90-100-6	0.0076	6	0.00026	2	1.46729	1.88649	6	0.282029	21	0.282026	-13.3	0.8	1.93	606	9
GJ1-40-90-100-6	0.0083	7	0.00026	2	1.46729	1.88677	12	0.281996	19	0.281993	-14.5	0.7	1.99	606	9
GJ1-40-90-100-6	0.0073	6	0.00026	2	1.46729	1.88684	10	0.282006	20	0.282003	-14.2	0.7	1.97	606	9
GJ1-40-90-100-7	0.0074	6	0.00026	2	1.46732	1.88683	11	0.282012	23	0.282009	-14.0	0.8	1.96	606	9
GJ1-40-90-100-8	0.0077	6	0.00026	2	1.46724	1.88663	11	0.282004	20	0.282001	-14.2	0.7	1.98	606	9