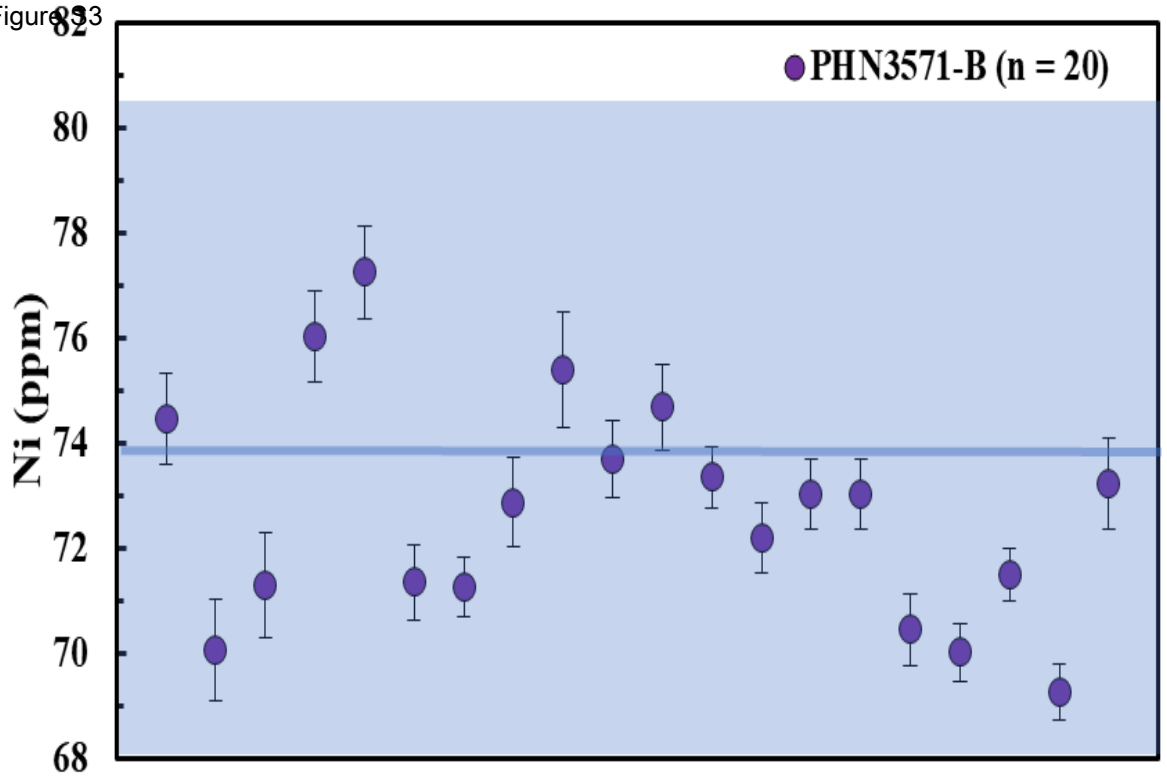
Supplementary Discussion

Figure S1

Figure S2

Figure S3

Click here to download Colour Figure Poitras et al_IJKC-FigureS3-Garnet-LA-ICP-MS-standard.pptx



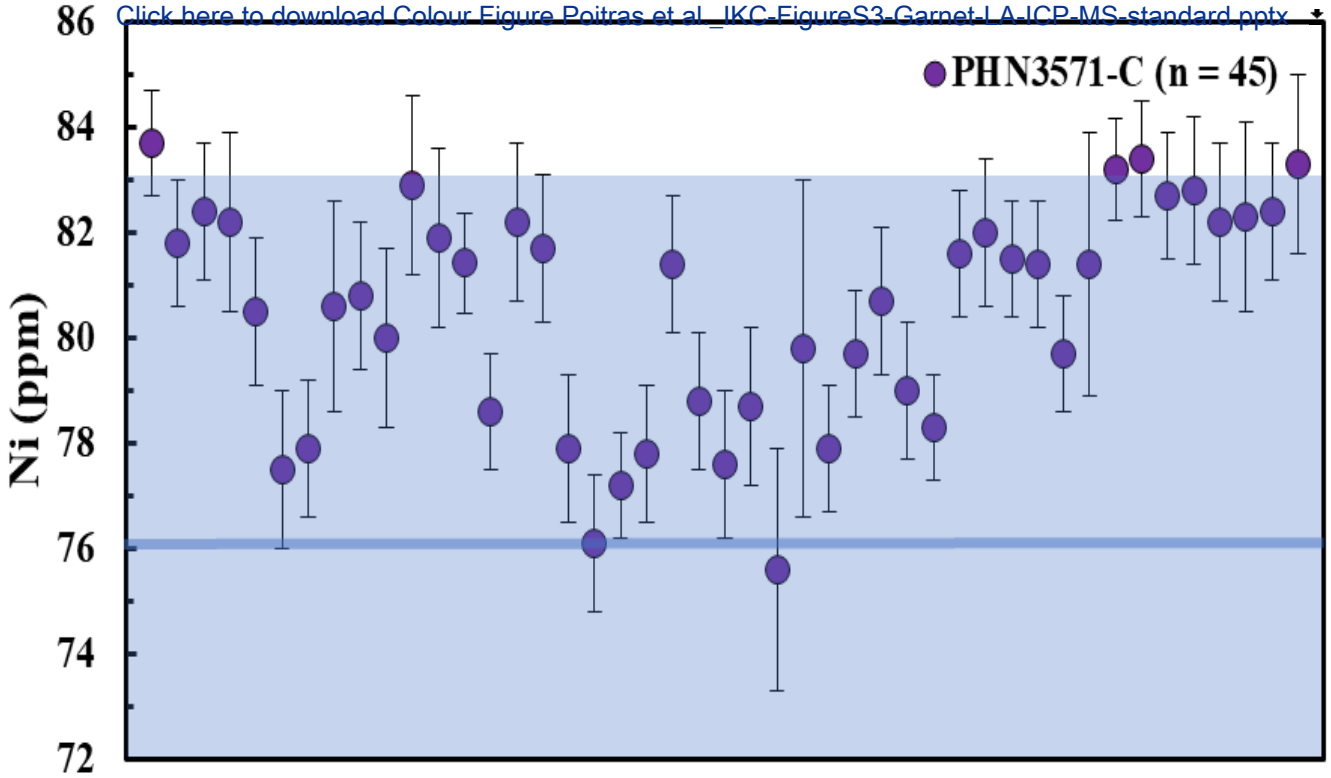


Fig. S1 – Ni concentrations for natural garnet megacryst PHN3571-B and -C secondary standard from garnet LA-ICP-MS individual daily runs with 2σ internal standard error. The blue line is the reference value, while the blue box is the 2σ std. dev.

Figure S4

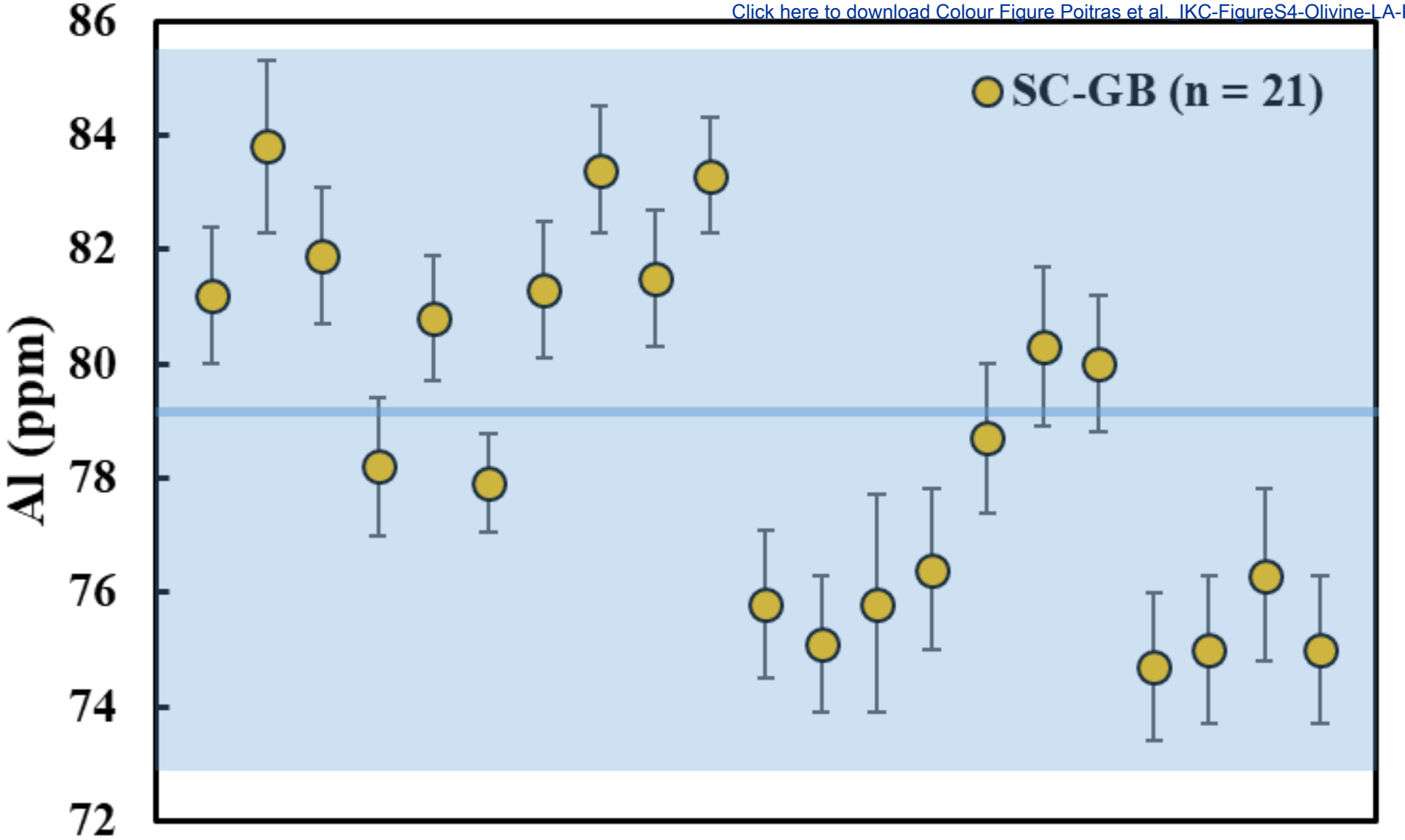
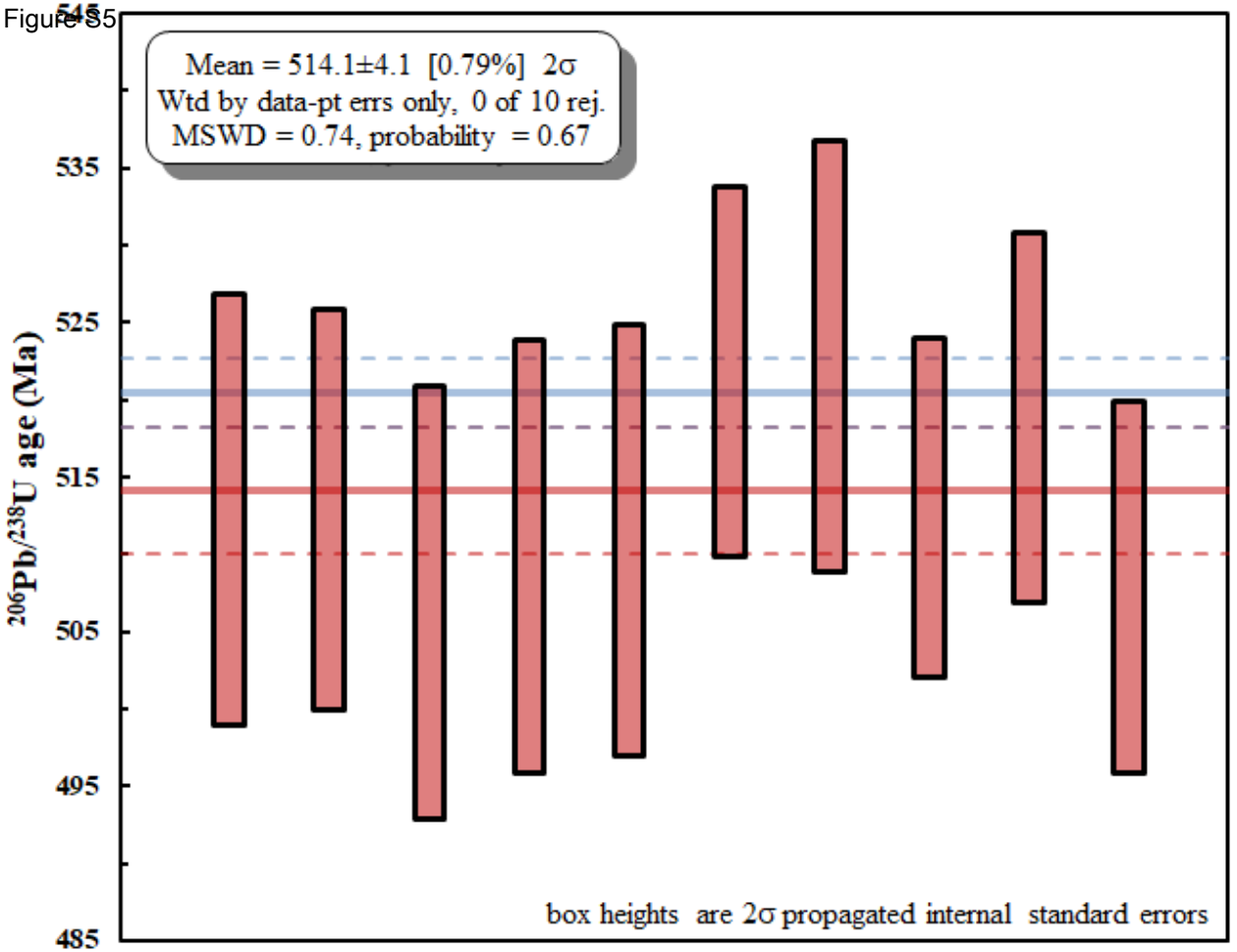


Fig. S2 – Al concentrations for San Carlos olivine (SC-GB) secondary standard from olivine LA-ICP-MS individual daily runs with 2σ internal standard error. The blue line is the reference value, while the blue box is the 2σ std. dev.

Figure S5

Click here to download Colour Figure Poitras et al._IKC FigureS5 Rutile U-Pb isotope standard.pptx



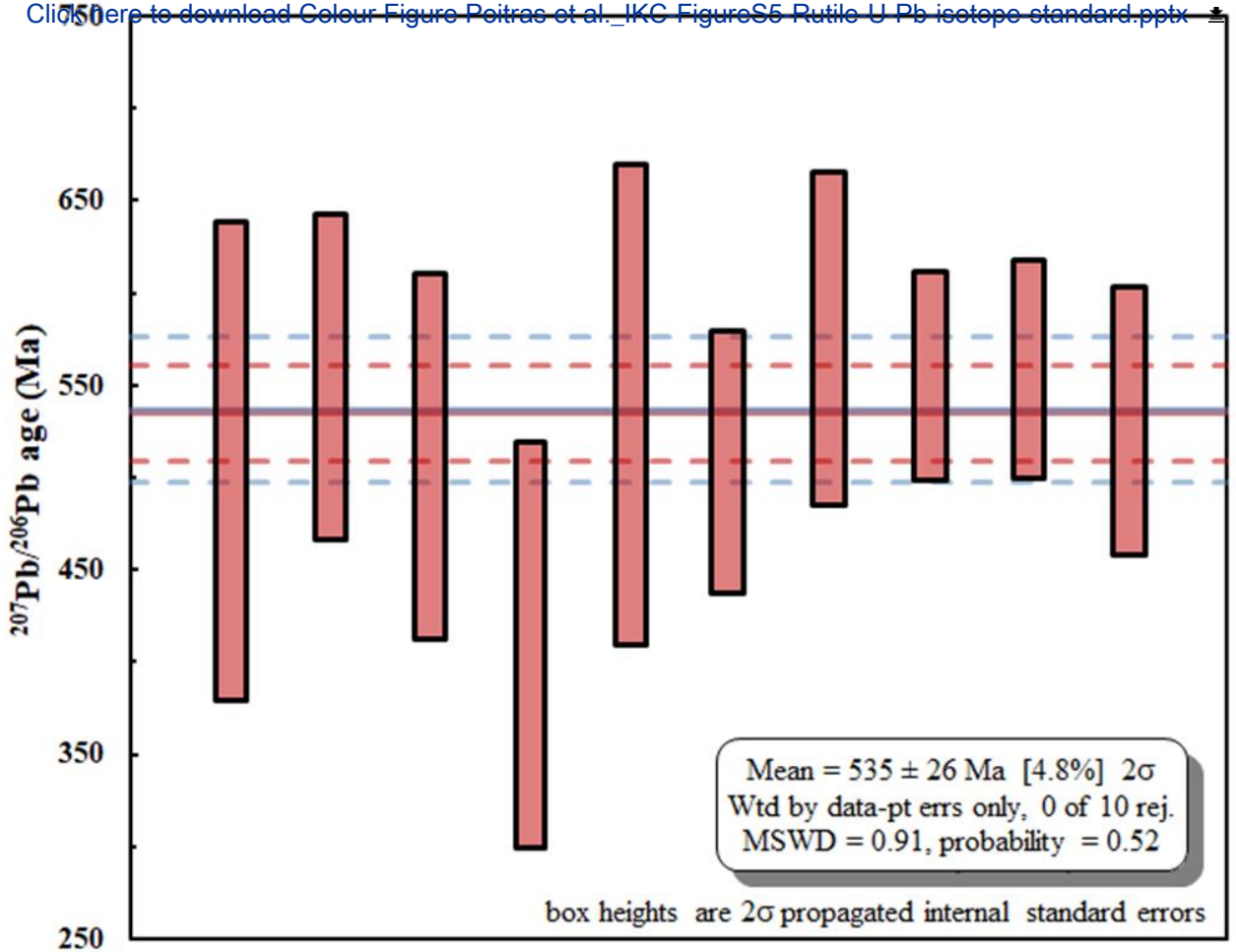


Fig. S3 – U-Pb ages for R13 rutile secondary standard over both sessions. Bold red horizontal lines represent weighted average ages, while dashed red lines represent 2s standard deviation. Bold blue horizontal lines represent the ID-TIMS accepted mean ages, while dashed blue lines represent 2s standard deviation.

Figure S6

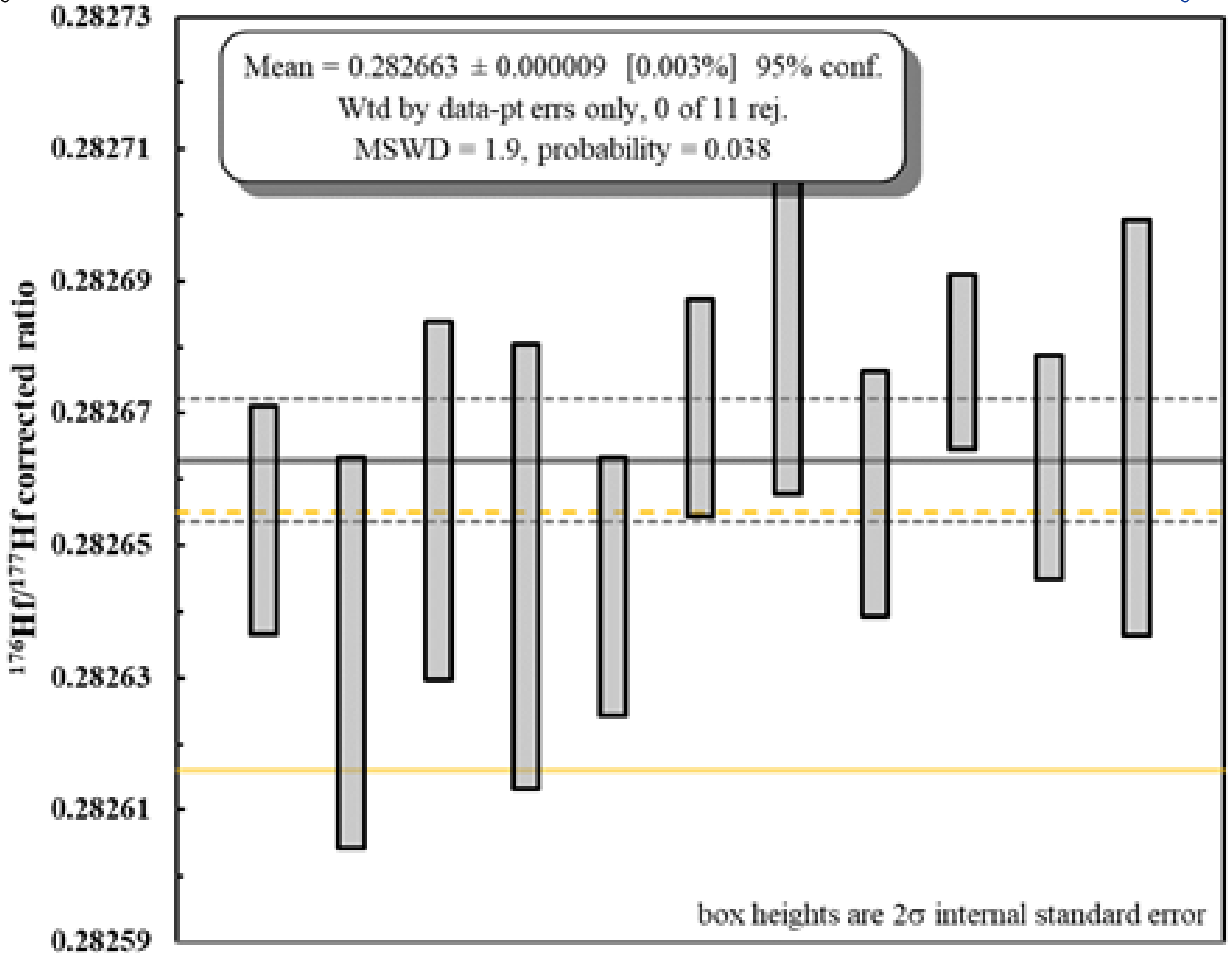


Fig. S4 – Frank Smith secondary standard $^{176}/^{177}$Hf ratio results for all MC-ICP-MS sessions. Solid Grey line is weighted average value. Dashed grey lines are uncertainty at 95% confidence interval. Solid yellow line is mean value from Nowell et al. (2004); dashed yellow line is standard deviation (2σ).

Figure S7

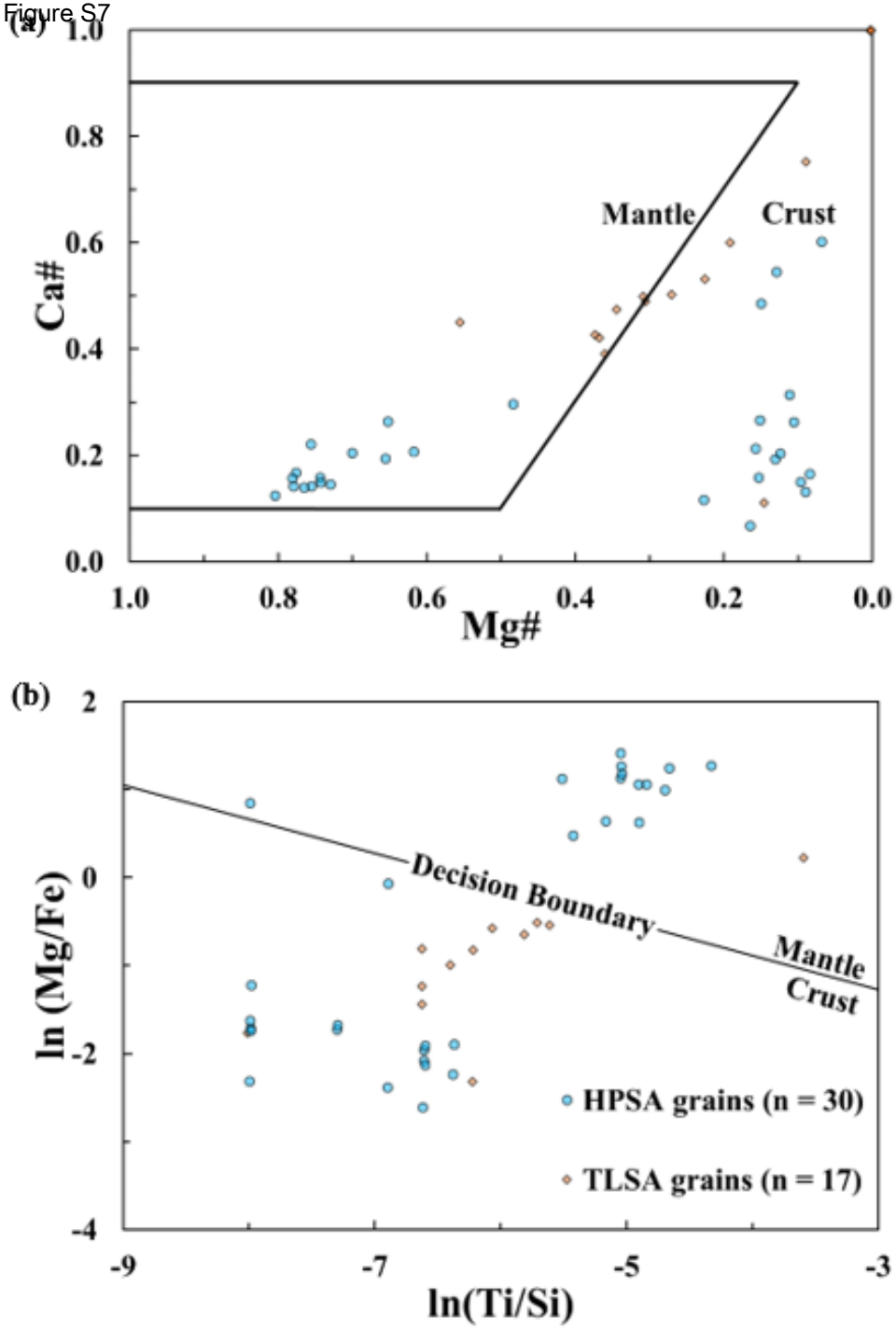


Fig. S5 – Low-Cr garnet discrimination plots**. (a)** molar Ca/(Ca+Mg) versus Mg/(MgFe) after Schulze (2003). **(b)** Graphical ln(Mg/Fe) versus ln(Ti/Si) statistical analysis after Hardman et al. (2018). Note only one TLSA low-Cr garnet in Schulze (2003) discriminant plots in the mantle field of Hardman et al. (2018).

Figure S8

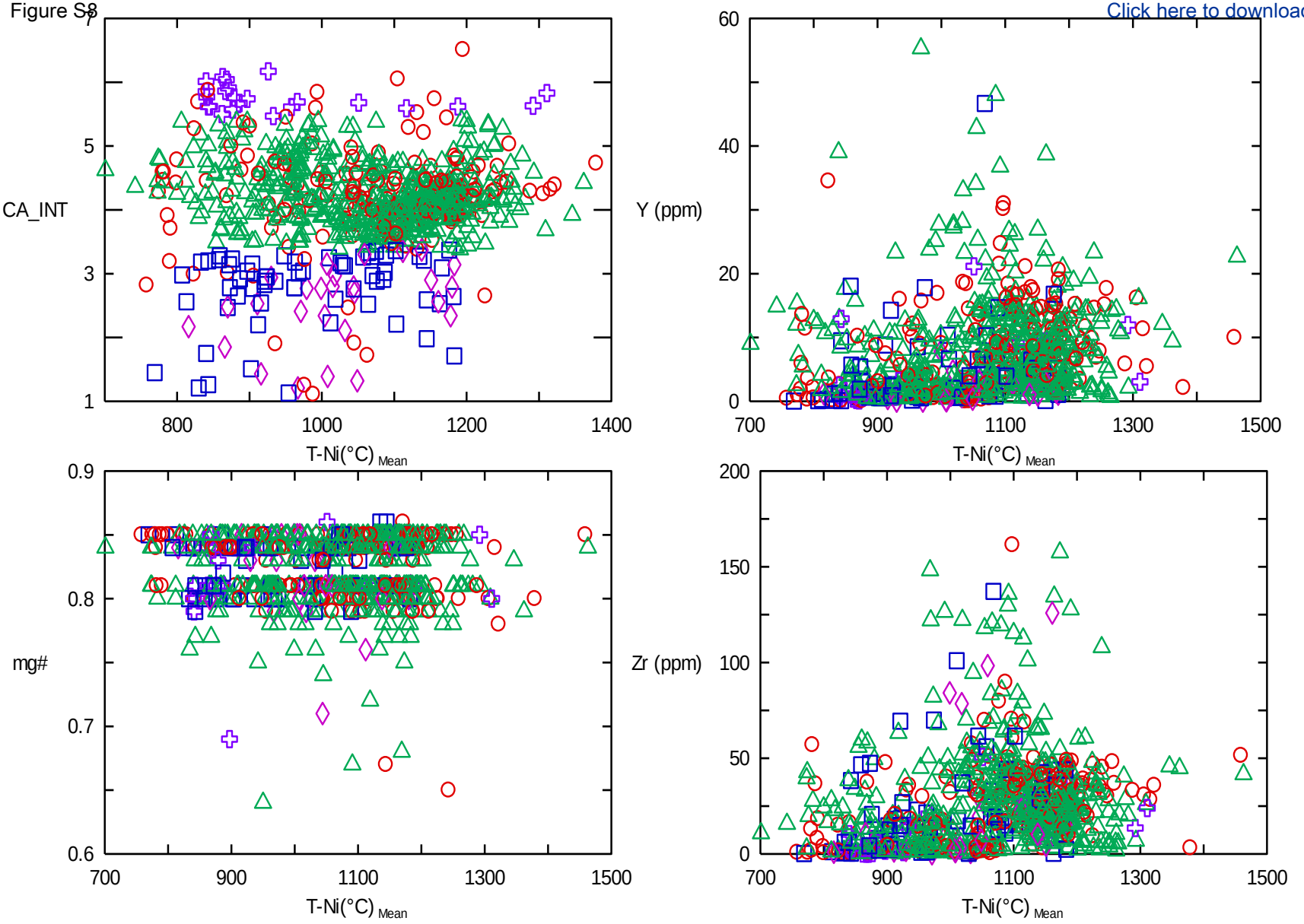


Fig. S6 – HPSA peridotitic garnet LA-ICP-MS major and trace element results plotted versus Ni-in-garnet temperatures (mean of Griffin et al. 1989 and Canil 1999). Symbol groupings are based on garnet classification after Grütter et al. (2004). Green triangles = G9, Blue squares = G10, Pink diamonds = G10D, Red circles = G11 and Purple crosses = G12 grains.

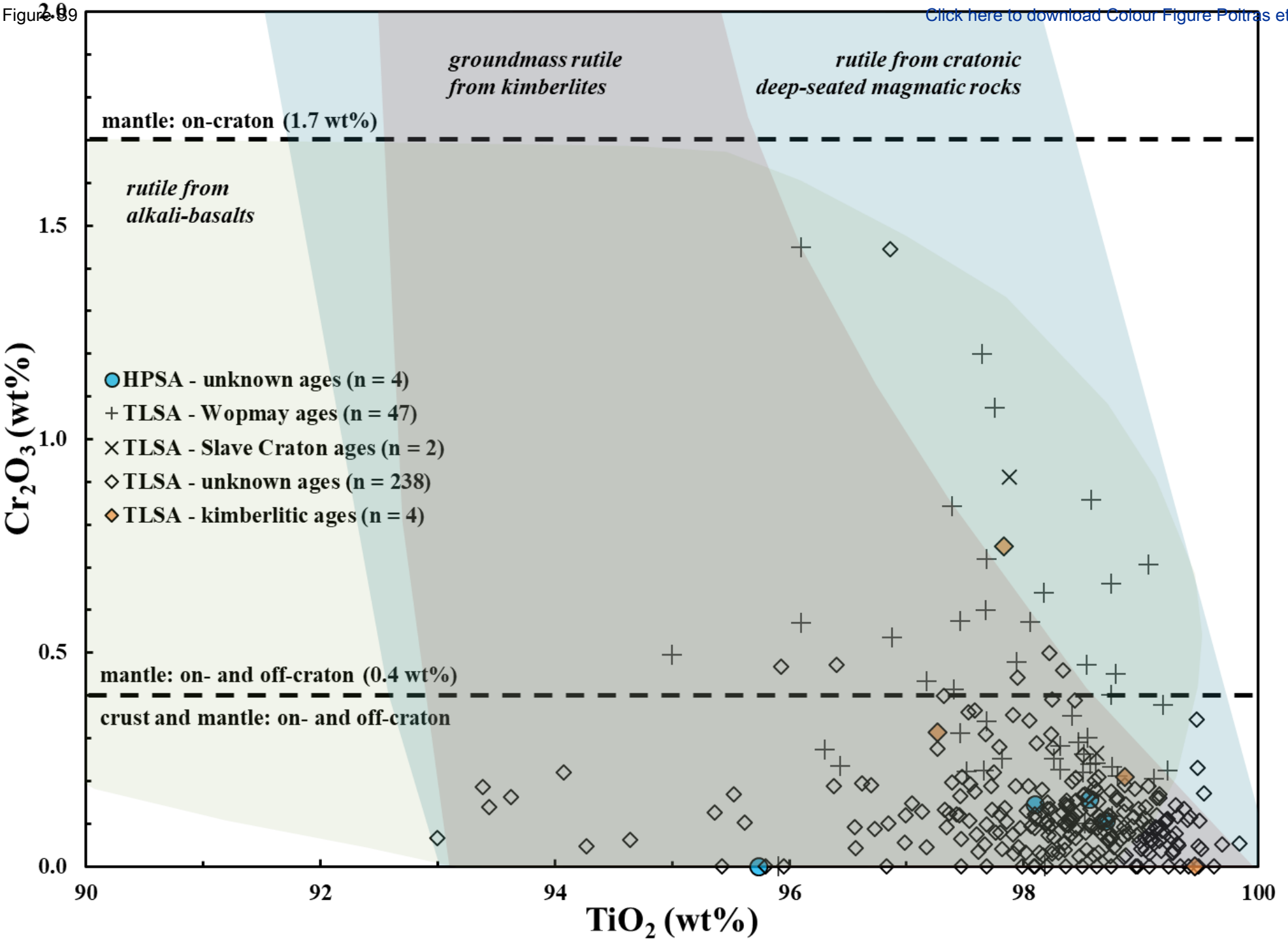
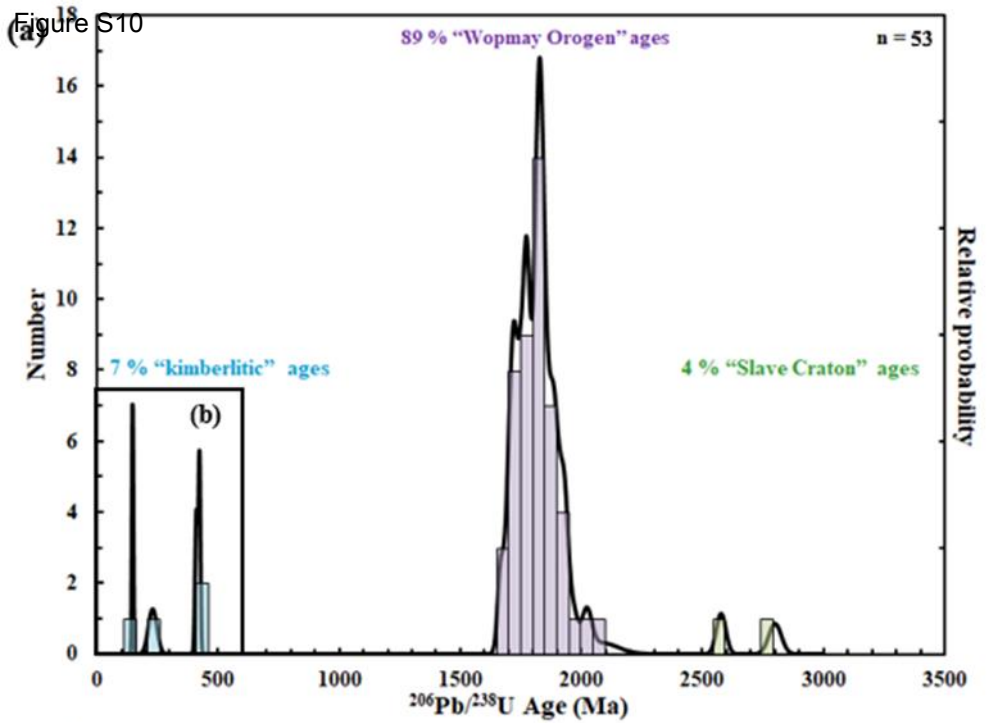


Fig. S8 – Rutile Cr_2O_3 and TiO_2 contents from both study areas. Fields after Malkovets et al. 2016. See legend for symbology.

Figure S10



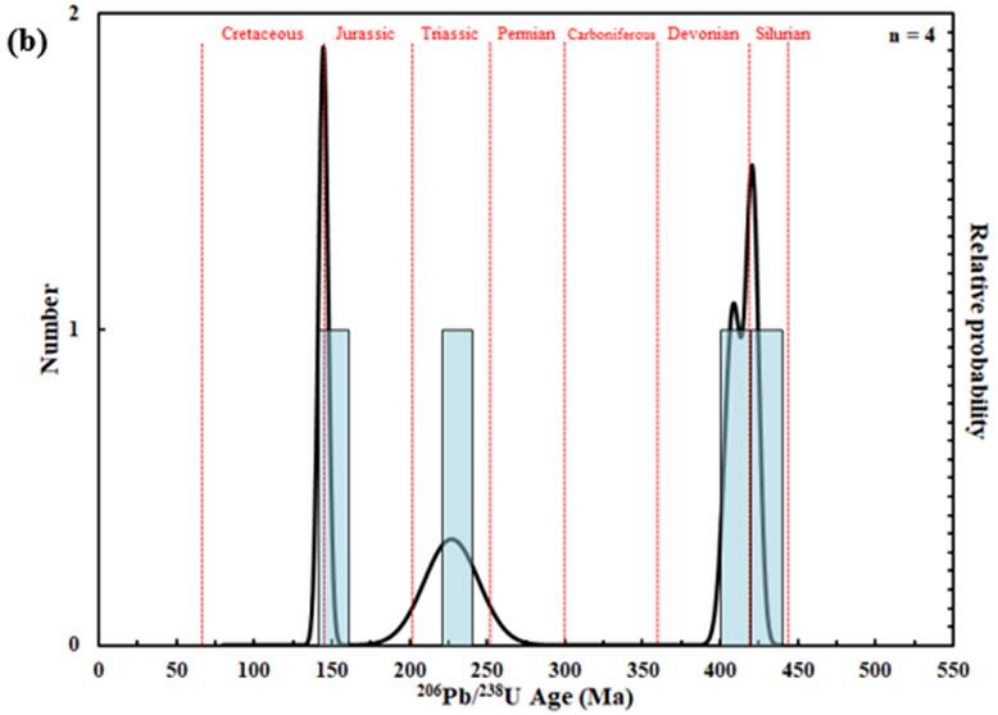


Fig. S9 – (a) $^{206}Pb/^{238}U$ apparent ages and density probability for all analyzed TLSA detrital rutile grains and inferred petrogenetic "age" source with inset for **(b)**. **(b)** $^{206}Pb/^{238}U$ ages for kimberlitic TLSA rutile grains. Relative probability bandwidth is 0.001 for both **(a)** and **(b)**. Light blue is kimberlitic ages, purple is Wopmay Orogen ages and green is Slave Craton ages (see text for details).

Figure S11

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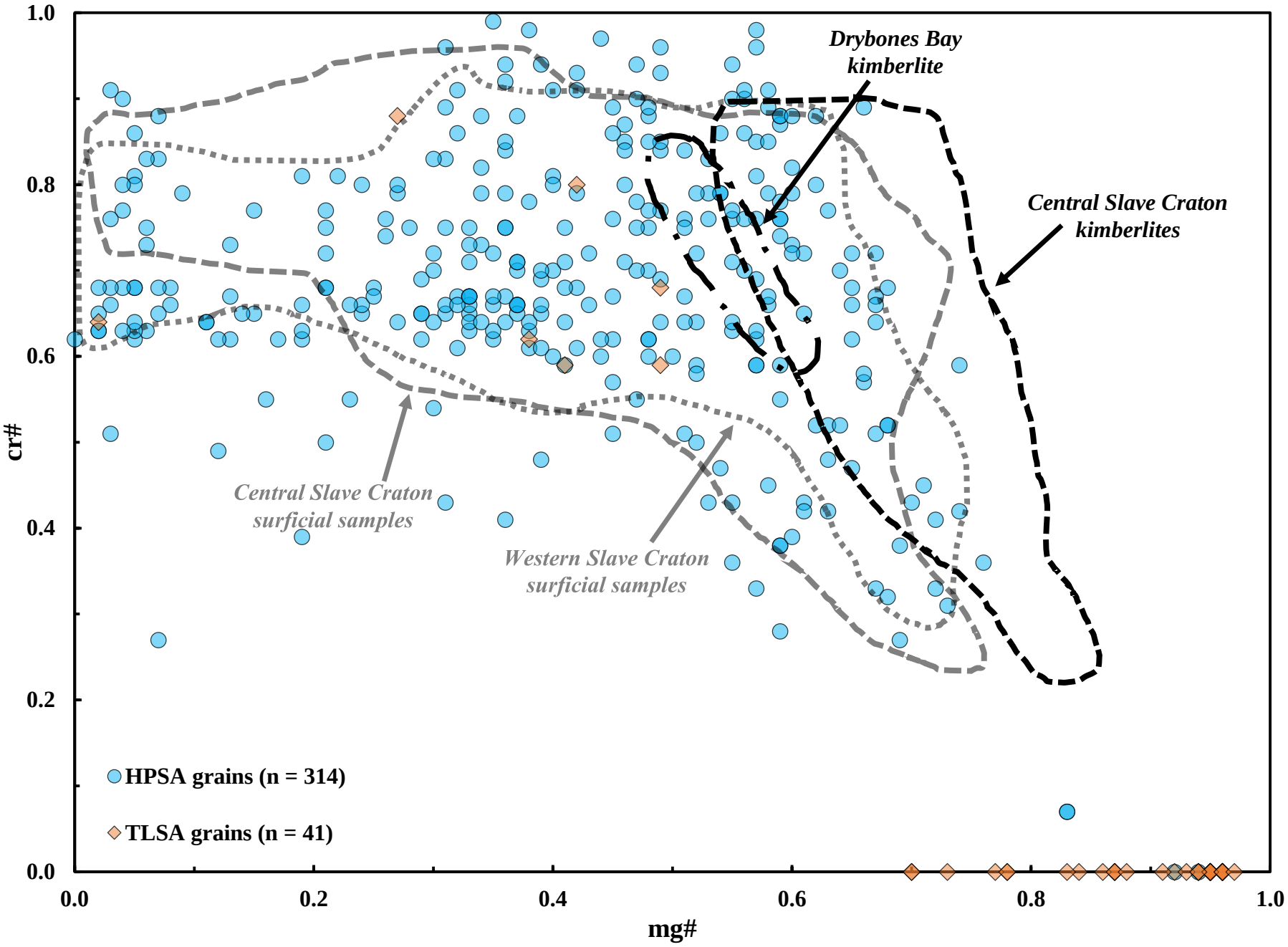

Fig. S10 – Spinel cr# (molar Cr/(Cr+Al)) versus mg# (molar Mg/(Mg+Fe)) discriminant plot (after Roeder and Schulze 2008). Grains from both study areas and 95 % contour interval fields for spinels from central and western Slave Craton surficial samples (grey dashed lines; data from NTGS GoData KIMC database), as well as the Drybones Bay and central Slave Craton kimberlites (black dashed lines; data from Schulze et al. 1995; Kerr et al. 2000; Creaser et al. 2004; Davies et al. 2004; Menzies et al. 2004; Aulbach et al. 2007, 2011; Roeder and Schulze 2008; Creighton 2009; Bussweiler et al. 2015). See legend for symbology.

Figure S12

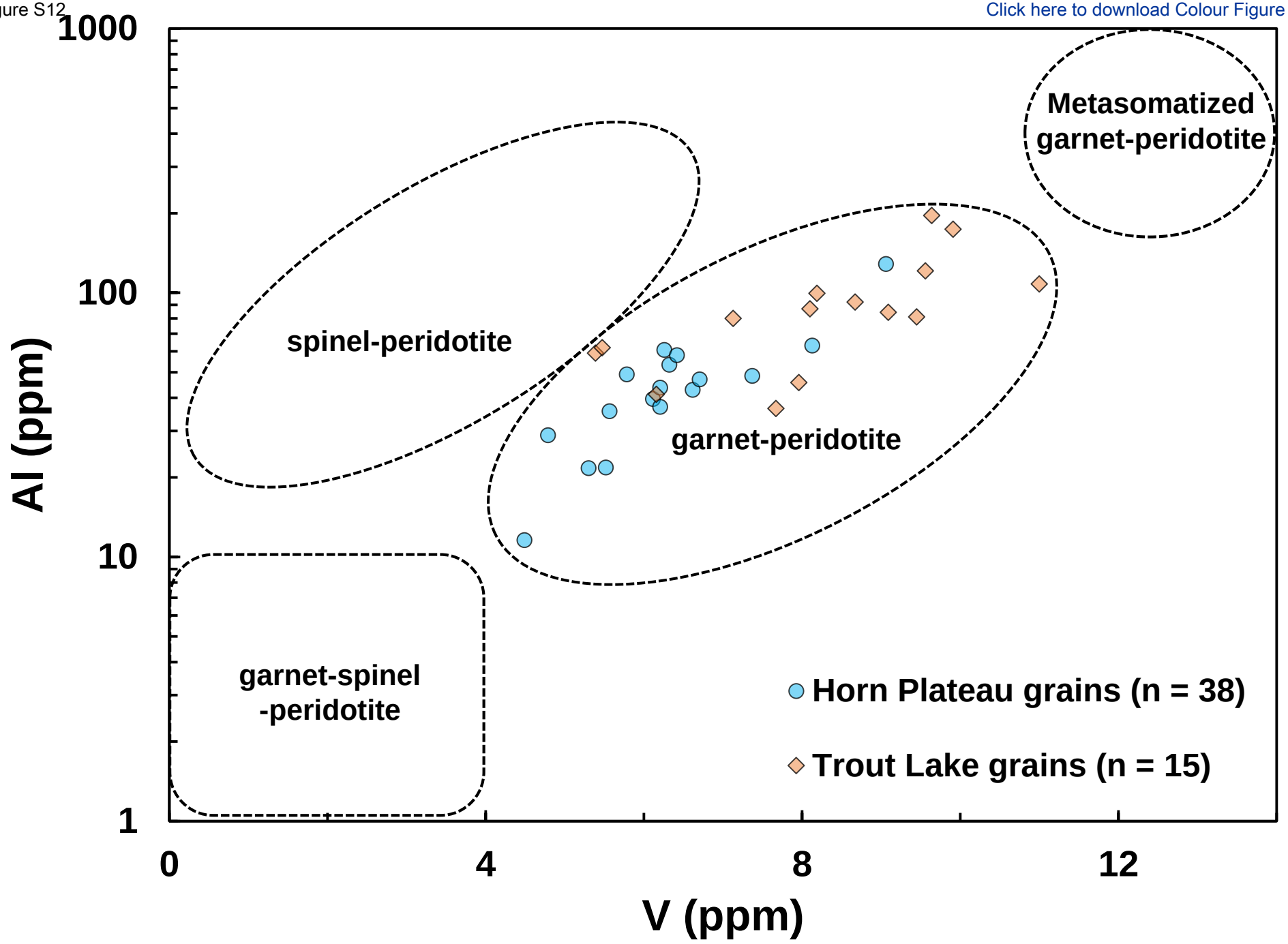

Fig. S7 – Al vs V mantle peridotite-facies discriminant (after Bussweiler et al. 2017) with olivine grains analyzed by LA-ICP-MS for trace element concentrations from both study areas.

Figure S13

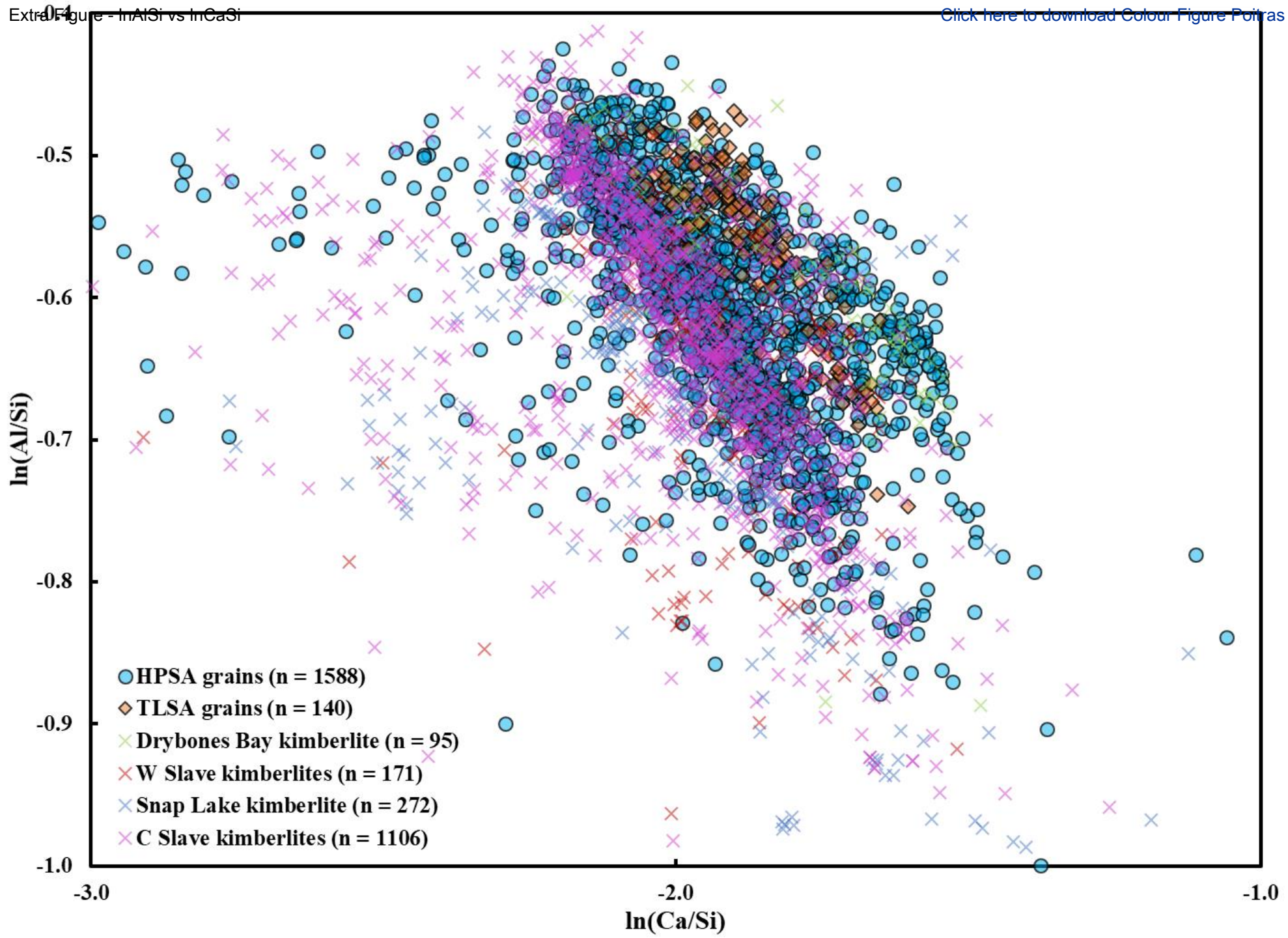

Fig. S11 – Peridotitic garnet Al and Ca cations expressed as natural logarithm and divided by Si cation common denominator (Pearce element ratio). See legend for symbology and text for sources of data. Note similarities of TLSA and some of HPSA grains with those from the Drybones Bay kimberlite in the upper right.