We investigated highly siderophile element (HSE: Os, Ir, Ru, Pt, Pd, and Re) concentrations and $^{187}$Os/$^{188}$Os ratios for ultramafic rocks distributed over the Eoarchean gneiss complex of the Saglek-Hebron area in northern Labrador, Canada in order to constrain to what extent variations in HSE abundances are recorded in Early Archean mantle that have well-resolved $^{182}$W isotope anomalies relative to the present-day mantle ($\sim+11$ ppm: Liu et al., 2016). The samples analysed here have been previously classified into two suites: mantle-derived peridotites occurring as tectonically-emplaced slivers of lithospheric mantle, and metakomatiites comprising mostly pyroxenitic layers in supracrustal units dominated by amphibolites. Although previous Sm-Nd and Pb-Pb isotope studies provided whole-rock isochrons indicative of $\sim3.8$ Ga protolith formation for both suites, our whole-rock Re-Os isotope data on a similar set of samples yield considerably younger errorchrons with ages of $3612 \pm 130$ Ma (MSWD = 40) and $3096 \pm 170$ Ma (MSWD = 10.2) for the metakomatiite and lithospheric mantle suites, respectively. The respective initial $^{187}$Os/$^{188}$Os = 0.10200 $\pm$ 18 for metakomatiites and 0.1041 $\pm$ 18 for lithospheric mantle rocks are within the range of chondrites. Re-depletion Os model ages for unradiogenic samples from the two suites are consistent with the respective Re-Os errorchrons (metakomatiite $T_{RD} = 3.4-3.6$ Ga; lithospheric mantle $T_{RD} = 2.8-3.3$ Ga). These observations suggest that the two ultramafic suites are not coeval. However, the estimated mantle sources for the two ultramafics suites are similar in terms of their broadly chondritic evolution of $^{187}$Os/$^{188}$Os and their relative HSE patterns. In detail, both mantle sources show a small excess of Ru/Ir similar to that in modern primitive mantle, but a $\sim20\%$ deficit in absolute HSE abundances relative to that in modern primitive mantle (metakomatiite $74 \pm 18\%$ of PUM; lithospheric mantle $82 \pm 10\%$ of PUM), consistent with the $\sim3.8$ Ga Isua mantle source and Neoarchean komatiite sources around the world ($\sim70-86\%$ of PUM). This demonstrates that the lower HSE abundances are not unique to the sources of komatiites, but rather might be a ubiquitous feature of Archean convecting mantle. This tentatively suggests that chondritic late accretion components boosted the convecting mantle HSE inventory after core separation in the Hadean, and that the Eoarchean to Neoarchean convecting mantle was depleted in its HSE content relative to that of today. In this talk, we will discuss the cause of HSE depletion in Archean mantle and how they were evolved to present-day compositions in line with W isotope evolution of the terrestrial mantle.

Highly siderophile element depletion in Archean mantle and its significance
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