

## **Re-Os and PGE systematics of 3.46 Ga meta-komatiites from the Dwalile greenstone Remnant, SW Swaziland**

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Based on the PGE abundances of high degree mantle melts, it has been proposed that chondritic material was mixed into the Earth's mantle throughout the Archean [1]. In contrast, Eoarchean mantle peridotites show almost the full inventory of PGE [2], suggesting either a heterogeneous mantle or the full inclusion of late veneer by c. 3.8 Ga.

Here we measured geochemically well-characterized serpentinized meta-komatiites and meta-komatiitic basalts from the 3.46 Ga Dwalile greenstone remnant in SW Swaziland for their Re-Os isotope composition and PGE abundances to place constraints on the PGE contents of their mantle sources.

Primitive mantle-normalized PGE patterns are flat and show ca. 0.3 to 2 times depletion and enrichment compared to the primitive mantle estimate as well as a strong Re depletion. The measured <sup>187</sup>Os/<sup>188</sup>Os isotope compositions of mafic to ultramafic samples vary from 0.1041 to 0.5473, indicating crustal contamination by older felsic crust as is also supported by Sm-Nd and Lu-Hf isotope and trace element systematics.

The least contaminated samples yielded initial <sup>187</sup>Os/<sup>188</sup>Os isotope compositions of 0.1034, close to the chondritic composition at 3.46 Ga. Together with the high PGE abundances, this argues for a full addition of late accreted chondritic material to the Dwalile mantle source. This is contrasting to the mantle source of the ca. 3.5 Ga Schapenburg komatiite mantle source farther N in South Africa that has only approximately 20% of the modern day PGE abundance present in its mantle source. Given the close areal proximity to the two komatiite system this indicates large heterogeneities within the Palaeoarchean mantle.

[1] Maier, W. et al. (2009) *Nature* 460(7255), pp. 620-623.

[2] van de Locht et al. (2018) *Geology* 46(3), 199-202.

[3] Puchtel, I.S. et al. (2016) *Geochem. Geophys. Geosyst.* 17 (6), 2168–2193.