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The Central Sudetes Rheic Ocean Ophiolites: Quantifying the spatial and temporal extent of the Indian Ocean-Dupal mantle signature

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The Indian Ocean-Dupal (Dupal herein) mantle signature is documented to be an integral component in the formation of the Carboniferous Palaeo-Tethys ophiolites. Spatially associated with the Palaeo-Tethys Ocean, the Rheic Ocean separated Laurussia and Gondwana after its conception during the latest Cambrian until closure during the Devonian-Carboniferous Variscan-Alleghanian orogeny. The age and location of Rheic Ocean ophiolites preserved within the Variscide belt offers an insight into the spatial and temporal extent, and also the origin of the Dupal mantle signature.

The Central Sudetes Ophiolites consist of the low metamorphic grade, partially dismembered Nowa Ruda, Braszowice and Ślęża mafic/ultramafic bodies of Lower Silesia, Poland. Geochemical analysis of extrusive and hypabyssal lithologies indicate that despite the majority of samples exhibiting characteristics compatible with formation within a SSZ setting (Th and LILE enrichment, Ta and Nb depletion), a significant MORB suite is also present. MORB offer an opportunity to isotopically fingerprint the underlying mantle source region, thus offering an insight into the chemistry of the southern hemisphere mantle at c. 420-400 Ma. Utilising the robust Hf-Nd systematics this study has succeeded in documenting the mantle domain from which the eastern Rheic Ocean was sourced whilst simultaneously constraining the timing and nature of a previous melt extraction event.