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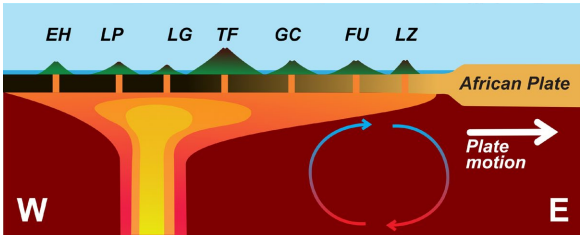

Chemical and isotopic tracers of the transition between oceanic and continental lithosphere in the Canary Islands

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Analysis of isotopic (Sr-Nd-Pb) compositions of olivine-hosted melt inclusions (MI) from Canarian volcanic beach sands with well-constrained provenance will help to constrain the origin and nature of compositional heterogeneity in the mantle source of the Canary Islands, which is key to understanding the evolution of both the Earth's mantle and Canarian magmatism. The Canary Islands overlie a mantle hotspot from which their volcanic activity originates. By combining isotopic and chemical data, the compositions and origins of the mantle components that contribute toward Canarian volcanism will be constrained.

Furthermore, the Canary Islands transect the West African passive continental margin, providing unique insight into the nature of continental input into the Canarian mantle plume. Comparison of the compositions of mantle-derived volcanic rocks from ocean islands located at varying distance from the continental margin will provide context for variations in the isotopically enriched 'EM1' mantle signature in Canarian volcanics (fig. 1). The origin of this enriched signature remains undetermined, but is often attributed to entrainment of continental material into the plume [1, 2, 3]. If this signature does in fact originate from a continental source, then the influence of the enriched component would be expected to decrease with increasing distance from the continental margin. Constraining the source of the isotopic enrichment in the mantle source of the Canary Islands may help to identify the sources of similar EM1 mantle signatures in other ocean island settings.

This project will utilise new 10^{13} Ω resistors with the University of Leeds Thermal Ionisation Mass Spectrometer to collect precise isotope ratio measurements of nanogram quantities, which will be combined with major and trace element compositions of both MI and host olivine. Preliminary MI data will be presented, including the first Sr-Nd-Pb isotope measurements from MI in the Canary Islands, in order to constrain the nature and origin of mantle heterogeneity in the mantle beneath the Canary Islands.

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