# Walvis Ridge-Tristan-Gough, South Atlantic – deconvolution of source components and dynamic mixing

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The South Atlantic hotspots provide a unique window to the lowermost mantle. Synchronous, sub-parallel and long-lived volcanism up to 130 Myrs along the Tristan-Gough, Discovery and Shona hotspot tracks as well as their alignment at the projected edge of the African Large Low Shear wave Velocity Province (LLSVP) supports their origin from plumes rising from the lower mantle [1]. Sampled in detail by multiple dredge cruises in a multi-national effort, the Tristan-Gough-Walvis Ridge seamount province provides unique insights into the longterm dynamic sampling of a plume generation zone related to a LLSVP forming the longest-lived, bi-laterally zoned mantle plume trail (~70 Myr) yet observed [2].

Our detailed dredge sampling of cruise MV1203 using the R/V Melville complements previous sampling, achieving a dense coverage of seamounts <70 Ma. Here an integrated major-trace element and Sr-Nd-Hf-Pb isotope data set on 33 seamounts <70 Ma is presented and evaluated in the context of the bi-laterally-zoned [2] versus the triple-zoned [3] plume models. The bi-laterally-zoned model remains valid, however, additional dynamic and source compositional information is hidden. The new data presented here further support the triple-zoned plume model [3]. The statistically significant mixing systematics allows us to deconvolve the range of source components, dynamic mixing effects and shallow plume-ridge interaction. The well-defined mixing endmembers in high-precision Pb isotope compositional space place important constraints on the origin of DUPAL in the context of global variations of oceanic basalts.

[1] O'Connor et al., 2013, *Nature Geoscience* **5**, *735-738*; [2] Rohde et al., 2013, *Geology* **41** *335-338*. [3] Class et al., 2015 Goldschmidt Conf.