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GR Focus Review

Hotspot tracks in the South Atlantic located above bands of fast flowing asthenosphere driven by waning pulsations from the African LLSVP

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Abstract

The location and crustal structure of hotspot tracks in the South Atlantic reflect where melts related to sluggishly flowing plume material can reach the plate surface. This raises the paradox of how long-lived, age progressive hotspot tracks can arise in the absence of closely spaced, narrow mantle plumes. Here we show that young hotspot trails in the southern South Atlantic are located above bands of seismically slow material in the asthenosphere, which we interpret as channels of fast-flowing asthenosphere fed by a large scale plume upwelling from the African LLSVP. A broad region of seismically slow asthenosphere in the vicinity of Paraná continental flood basalts may be indicative of a long-lived, large scale plume under the South American plate. We propose that hotspot tracks developed above fast flow channels in the asthenosphere that evolved between these large-scale plumes as they

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