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DIPARTIMENTO DI GEOSCIENZE

Seminario

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Plate-Driven Micro-hotspots: Cases from Soutwest Indian ridge

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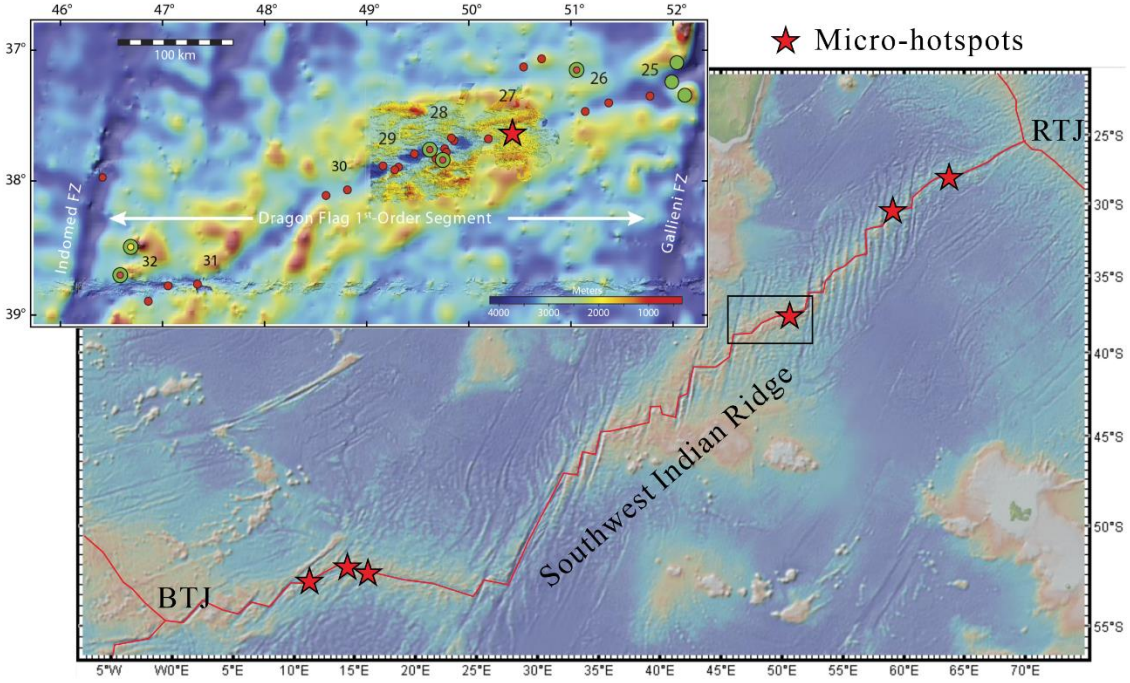

Abstract

The magmatism along the axes of mid-ocean ridges is far more heterogeneous than hitherto thought, which is closely related to the partial melting beneath the ridge axis. The origin of melting anomaly could be derived from: (1) mantle plumes, (2) mantle source modification by subduction, (3) stranded lower continental crust or continental lithospheric mantle mixed with the upper mantle. The Dragon Flag melting anomaly from the Southwest Indian Ridge (SWIR), flanking with 1-2-km high rift mountains, exhibits extreme robust magmatism and has the thickest crust yet found along the entire SWIR, up to 10 km thick for segment 27. New major-, trace-element, and Sr-Nd-Pb isotopic data for the Dragon Flag Supersegment indicate that a hotspot-ridge interaction cannot account for the observed melting anomaly, which is rather due to locally focused melt flow in the mantle. These local melting anomalies could be termed as "micro-hotspots", which are an order of magnitude smaller than Wilson's classic hotspots, and are not fixed in the hotspot referenced frame. They can grow and remain stationary for extended periods of time, or migrate freely with respect to one another, driven by the evolving plate-tectonic stress field. Five additional micro hotspots could be recognized along the SWIR, i.e. at Joseph Mayes Seamount, Narrowgate Magmatic Segment, 16°E Segment, Atlantis Bank Supersegment, and Eastern SWIR 60°-70°E melting anomaly.

Proponente: **Christine Meyzen**