Goldschmidt 2026 Abstract
https://doi.org/10.46427/gold2026.35953

Central Indian Ridge - Réunion hotspot interaction at 19°S: Basalt geochemistry from a dense sampling up to 1 Ma

CHRISTOPHE HÉMOND[1], JEROME DYMENT[2] AND CHRISTINE MARIE MEYZEN[3]

[1]CNRS-UMR GEO-OCEAN, Univ. Brest-CNRS-IFREMER-UBS

[2]Institut de Physique du Globe de Paris

[3]Dipartimento di Geoscienze, Università di Padova, Padova 35131, Italy

This work addresses the connection between the Réunion hotspot plume and the Central Indian Ridge (CIR) melting region in the area of mixing between Réunion hotspot material with the CIR depleted mantle source. We use a large number of samples collected along two transects at 19°12' (northern traverse NT, 64 samples) and 19°29'S (southern traverse ST, 56 samples)) across the ridge axis in the area of ridge-hotspot interaction. Samples were collected along the NT (resp. ST), at intervals of about 0.5 km. Cordier et al. (2010) analyzed a partial set of 25 samples from the NT and revealed spikes of trace element enrichment symmetrical with respect to the axis. Sr and Nd isotope ratios also exhibit a bimodal symmetrical distribution grossly correlated with (La/Sm_n). Here we present major and trace elements, Sr, Nd, Pb on the full set of samples and a partial set for Hf isotopes. At first glance, along the NT, the numerous additional samples do not contradict Cordier's observations. The enriched samples are proportionally very abundant: 17 Enriched (E) versus 28 Transitional (T) and 20 Depleted (D) (after Gale et al., 2014). The increased sampling density and increased number of variables confirms the symmetrical distribution and periodic enrichment pattern suggested by Cordier et al. (2010). The trace element variations along the ST do not present any clear symmetry. The classification of the ST samples is very different with 3E, 7T, 47D. The few enriched samples are all located on the African flank. The scarcity and the distribution of the enriched samples along the ST do not fit the model of melting waves of Cordier et al's. The data suggest the input of the only known enriched source in the vicinity underneath the African lithosphere: the Réunion deep seated mantle plume. Additional variables on the NT samples require three mantle components, including one observed in Gasitao Ridge samples. We will discuss this new trace element and isotope dense dataset within that framework.

Refererences

Cordier et al., 2010, G3, 11, Q0AC06

Gale et al., 2013, G3, 14, 459-518.