



Interaction of the Reunion hotspot and the Central Indian Ridge near Rodrigues Island (Indian Ocean)

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Reunion hotspot is often viewed as a typical intraplate hotspot, which can be traced back along the southern Mascarene Plateau and the Chagos - Laccadive Ridge to the Deccan flood basalt, caused by the inception of a mantle plume head by the Indian lithosphere. The Rodrigues Ridge, an E-W trending structure more than 600 km-long and 2500 m-high above the seafloor, and small volcanic features that extend it up to the Central Indian Ridge axis at 19°S, do not fit well into this scheme and more probably correspond to the manifestation of an interaction of the Reunion hotspot with the Central Indian Ridge.

In this talk we present bathymetric, geophysical and geochemical evidences for such a ridge-hotspot interaction as provided by the analysis of data and samples collected by cruises Magofond 2 of R/V Marion Dufresne (IPEV, France), Gimnaut of R/V L'Atalante with deep-sea submersible Nautille (IFREMER, France), and KNOX11RR of R/V Reville (Scripps Institution of Oceanography, USA). The reality of the ridge hotspot interaction is substantiated by the shallow bathymetry and the "hot" morphology of the Central Indian Ridge, as well as the presence of volcanic ridges – the Rodrigues, Three Magi and Gasitao ridges – which exhibit isotopic signatures intermediate between those of the Reunion hotspot and MORB. The few age determinations obtained on the Rodrigues Ridge and its eastern extension suggest synchronous pulses of activity on the hotspot and the region of interaction with the spreading centre: the first pulse, between 12 and 8 Ma, corresponds to the shield volcano building of Mauritius Island and the formation of the Rodrigues Ridge, whereas the second pulse, since about 2 Ma, results in the building of Reunion Island, the formation of Rodrigues Island, Three Magi and Gasitao ridges close to the Central Indian Ridge. These pulses are further confirmed by the detailed evolution of the ridge segmentation of the Central Indian Ridge for the last 10 Ma, deciphered from the dense bathymetric and magnetic coverage of the area.