



## Vertical movements of the oceanic lithosphere above La Reunion hotspot

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While La Reunion hot spot is often considered as a typical mantle plume, several studies have pointed out the complexity of its history, and documented major differences with the Hawaiian archetype. We present new seismic data to discuss vertical movements related to La Reunion-Mauritius intraplate magmatic activity.

High resolution seismic reflection data acquired during the FOREVER cruise in 2006 (for a presentation of the cruise, see Deplus et al., this meeting) document the evolution of lithospheric flexure related to Mauritius and Reunion loading. With a total length of 12200 km, the seismic profiles span a large area, basically the whole compartment between the Mahanoro and Mauritius fracture zones, at latitudes ranging from 19 to 25°S. Seismic penetration reaches the top of oceanic basement, i.e. up to 1.5 s of penetration. Maps of basement topography and sediment thickness have been derived from these and previous data (cruise REUSIS, 1993). The FOREVER data provide no information on seismic velocities, even in the shallowest layers, due to a 240 m long streamer and a waterdepth over 2000 m. Time-to-depth conversion of the seismic interpretation has been done for a range of likely velocities, based on published results from deep multichannel seismic reflexion and OBS data from the REUSIS cruise.

The sedimentary and volcanoclastic deposits are much thicker to the North and East of La Reunion. Both tectono-magmatic deformation and gravitational processes disrupt the stratigraphic column, especially in the southern area of the survey. In several places, sedimentary reflectors are deformed or disrupted by basement highs. Correlation of seismic horizons indicates that magmatic activity occurred well after oceanic basement formation, in places quite recently, and with a spatial distribution not simply related to the known volcanic activity.

Three major units are identified in the vicinity of Mauritius. The lower one, resting directly on oceanic basement, is bounded on its top by an angular unconformity which we interpret as the onset of volcanism at Mauritius. It is overlain by a wedge of subhorizontal reflectors, thickening towards Mauritius. The upper, younger unit is a volcanoclastic sequence attributed to La Reunion volcanic activity and contemporaneous hemipelagic deposit. Its base correlates with the base of the volcanoclastic apron of La Reunion. As expected from previous results, the oceanic plate does not show the regional depression expected from flexural models of island load beneath La Reunion edifice. On the contrary, the seismic stratigraphy, established from the FOREVER seismic data, documents flexure towards Mauritius that appears to terminate at the onset of La Reunion volcanic activity. Results are in agreement with preliminary Bouguer anomaly map obtained using the marine gravity data collected during the FOREVER cruise, and the sediment thickness deduced from the seismic profiles.