



## **Hotspot dominated rifting – The instance of São Miguel (south-eastern Terceira Rift, Azores)**

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The Azores Archipelago consists of nine islands spread over the triple junction between the Eurasian, African and North American tectonic plates, the so-called Azores Triple Junction. The location of the Mid Atlantic Ridge, which forms the boundary between the North American and Eurasian/African plates, is well determined; on the contrary, the exact details of the boundary between the Eurasian and African plates remain unclear. As a result, five different geodynamic models were drawn by several authors aiming to resolve the configuration of this boundary. In this context, a marine geophysical survey with the German RV METEOR was carried out in the water of São Miguel in summer 2009, the largest and most populated volcanic island of the Azores located on the south-eastern Terceira Rift. To get a better idea of the structural evolution of this area, a multi-disciplinary dataset was collected combining a variety of several data sources for the first time. It contains about 4500 km swath sounder and parametric sediment sub bottom echo sounder recordings, 2000 km of multichannel seismic and 2600 km of magnetic profiles, 5000 km gravity data as well as two wide-angle reflection/refraction profiles.

The bathymetry reveals a NW-SE striking sigmoidal basin with São Miguel in its central part. The basin margin is characterised by faults and volcanic ridges. Seismic data show growth strata and internal unconformities above tilted blocks suggesting ongoing syn-tectonic sedimentation during extension. In addition, more than 600 tuff cones with diameters of a few hundred meters have been detected in the bathymetric data. They partially correlate with clear magnetic anomalies, which indicates their recent activity and, in general, the intense sub marine volcanic processes in this region. In interaction with the tectonic processes, the intensified upwelling of magmatic material again leads to more complex structures in the basin as generally occur in the case of pure rifting. This difference in tectonic pattern is expressed by a huge amount of normal faults not dipping basinward but in the opposite direction.

Based on this preliminary analysis we interpret the basin in the vicinity of São Miguel as a volcanically active leaky and dextral transform fault that links two segments of the Terceira Rift. However, the gravity data does not reveal a negative Bouguer-anomaly which would be expected for rift zones.