

Interaction between volcanisms inland and the spreading center: example of Galápagos archipelago

*Walid Ben Mansour¹, Guust Nolet², Mario Ruiz³, Juan Carlos Afonso¹

1. Department of Earth and Planetary Sciences, Macquarie University, Sydney (Australia), 2. Geoazur, Université Côte d'Azur, Sophia Antipolis (France), 3. Instituto Geofísico, Escuela Politécnica Nacional, Quito (Ecuador)

The Galápagos archipelago, located west of Ecuador, is a good example where a mantle plume interacts with a spreading center and modifies physical and chemical properties of the oceanic lithosphere. The Galápagos Spreading Center (GSC) and the Galápagos hotspot interact over more than 1,000 km with unusual features for a hot spot region (large number of historical active volcanoes, large range of lavas composition, alignment of volcanic centers and seamounts). To bring new information on the physical and chemical properties of this region, we are constructing a new P-wave velocity model of this region by combining data from 10 seismic broadband stations and from 9 MERMAIDS (Mobile Earthquake Recorder in Marine Areas by Independent Divers) deployed in this region between 2014 and 2016. We focus on Pn head waves to better constraint the Moho depth in this region and image the interaction between the hot spot and the GSC. We selected 150 seismic events between May 2014 and September 2016, with epicentral distance between 3° and 35° and picked more than 2,500 Pn phases that we will invert in a probabilistic tomography inversion in a second step. In this presentation, we will show examples and statistics of Pn data. We will discuss the benefits of developing a multi-observable thermochemical tomography in this region to better image the intricate interaction of a hot spot with the overlying oceanic lithosphere and evaluate current physio-chemical evolutionary models.

Keywords: Pn tomography, mantle plume, thermochemical structure