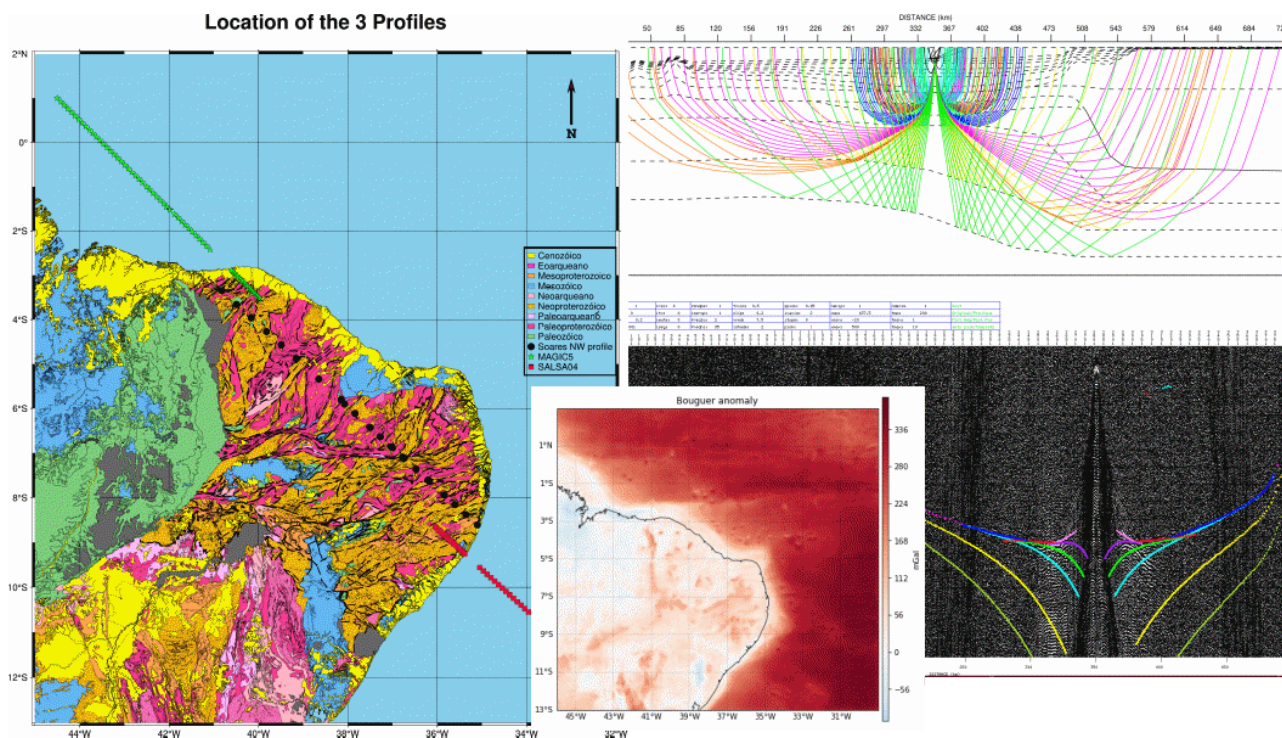


*A comprehensive analysis of the deep Lithospheric Structure from Wide-Angle Data ?  
geodynamic implications, rifting and break-up: Brazilian continental margins case study*



**Figure** – location of the profiles in Borborema province, NW of Brazil; example of ray tracing and prediction of station MC5OBS16 (Ocean profile in the NW); bouguer anomaly for the Borborema province from satellite gravity data

The integrated analysis of deep structure, tectonic movements, sedimentary transport and record in the deep basin, at different time-scales, applying direct and indirect methods (seismic, potential fields, geochemistry, etc.) in different disciplines (paleo-environment, geology), allow to restore the overall evolution of a continent break-up, including the continental morphology, the thermal evolution and the role of the tectonic heritage, the birth and evolution of the Atlantic Ocean. In this global setting, passive continental margins have a specific situation: they represent the scars of the break-up, and are the receptacle of the products of erosion, dynamic topography and paleo-climate variations.

One major impediment to our understanding of margin formation is the limited information about the deeper structures of the lithosphere. The use of direct methods (sampling, geochemical analysis, etc.) is very limited due to the depth of these structures (30km deep) and we rely on indirect methods (wide-angle seismic, reflection seismic, gravity, magnetics, etc.) to search for some hints about these structures in a detailed geodynamic context. The origin and the recurrence of these stratifications is still on debate: magmatic intrusion? Stretching effect during the break-up? Their role in the oceanization process? On the thermal history and the vertical subsidence of uplift?

Between the crust and mantle, the Mohorovicic discontinuity (Moho) is consensual and has been studied for more than 100 years. In spite of that, there are still many uncertainties on the nature and the thickness of this discontinuity and we can find seismic Moho, petrological Moho, receiver function Moho which argue for a non-simple limit between two different materials.

The main focuses of this PhD research program are:

- to have a better understanding of the characteristics and dynamic relationship between lower Crust, Moho and Lithospheric Mantle
- to establish domains and discuss petrophysical features of each layer. To understand how they influence the superficial structures and the tectonic and thermal evolution