



Study of physical and structural properties in the region of the Pantanal, Paraná and Chaco-Paraná Basins using joint inversion of gravimetric observations and surface waves velocity

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Abstract

Gravimetric and seismological data will be used to derive 3D models of density and S-wave velocity for the Pantanal, Paraná and Chaco-Paraná basin regions, through the joint inversion of these two types of geophysical data. Initially, for the gravimetric case, we will combine satellite data (GOCE) with freshly collected terrestrial data in the Paraguay region to increase the resolution of the gravimetric model. The effects of topography, sediments and variation of the Moho topography on the gravitational field will be removed to isolate the density anomalies inside the crust and the upper mantle. Surface wave data will be processed for determination of group velocity curves for Rayleigh and Love waves, for each source-receiver pair, from seismograms recorded by the Brazilian Seismographic Network (RSBR) and the temporary arrangement of XC stations. In the beginning, density and velocity models will be obtained independently. Then, a joint inversion of the residual gravimetric data and the Rayleigh and Love dispersion curves will be performed. To integrate the gravity anomaly data with the seismic wave velocity in the joint inversion scheme, we will test empirical relationships suggested in the literature. The obtained models will be compared to evaluate the results consistency. Thus, we hope to contribute with new models of the crust and the upper mantle physical properties. It will help to provide new links about the current thermal and compositional state of these three basins and to understand their geodynamic evolution, emphasizing the poorly known region of the Pantanal basin.

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