

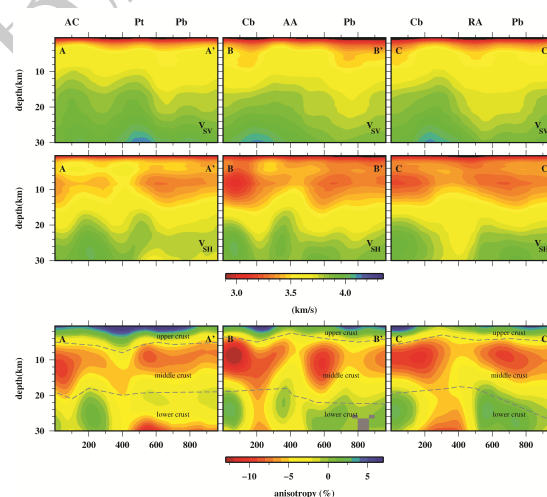
# Crustal structure using ambient seismic noise in west-central Brazil

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## Abstract

Classical surface wave analysis provides important information about the crustal structure in west-central Brazil, but it is challenging to obtain reliable velocity models at this semi-aseismic region because of the lack of local earthquake records. However, a crustal structure obtained with teleseismic tomography are not usually robust enough to be used for interpretation of geological evolution. To alleviate this problem, a temporary deployment of seismic stations was installed as a FAPESP “3 Basins Project” to study the Pantanal, Paraná and Chaco basins using interferometry (e.g., ambient seismic noise) approach. Ambient seismic noise methods are now well-established and used in different period bands for different scales. Therefore, the continues recorded data in the five sub-network cross-correlate to retrieve inter-station empirical Green’s function (EGF) signals. These sub-networks are including (1) XC with 35 stations (from FAPESP project), (2) BL with 19 stations, (3) BR with 15 stations, (4) ON with two stations, and (5) GT one station. Before cross-correlation, removing mean and trend, bandpass filtering (4 to 80 sec) and normalization (time and frequency domains) are necessary for single station preparation. Surface waves tomography indicate that the thin crust is appeared in the Pantanal basin, while thick crust becomes evident in Chaco and Paraná basins. Also, the discrepancy between shear wave velocity models, obtained from Love and Rayleigh waves, was generally used to calculate the presence of radial anisotropy. This model indicates the thickness of the upper crust, with relatively positive radial anisotropy, varies from subsurface to maximum depths of 8 km, while middle crust with relatively negative radial anisotropy extends to a maximum depth of 25km. Whereas, the lower crust has relatively positive radial anisotropy. Moreover, the middle crust beneath the Chaco-Paraná basin is thinner than the Paraná basin.



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