

# **Teleseismic P-wave Tomography Beneath the Pantanal, Paraná and Chaco-Paraná Basins, SE South America: Delimiting Lithospheric Blocks of the SW Gondwana Assemblage.**

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## **Abstract**

We present velocity anomalies for the upper mantle beneath the Pantanal, Paraná and Chaco-Paraná basins, using teleseismic P-wave tomography. Three hundred thirty-nine stations were used to record 4989 events for P and PKIKP phases, during the years 1992-2017. A new temporary deployment with 34 stations improved the coverage in that region. A high-velocity anomaly beneath the Paraná Basin was interpreted as a cratonic basement. Its northern portion is consistent with the cratonic block presented by Cordani et al. (1984), and the southern portion is consistent with that presented by Mantovani et al. (2005). Low-velocities are consistent with the limits of the Rio de la Plata Craton, proposed by Rapela et al. (2011). A low-velocity anomaly under the Pantanal Basin correlates with the seismicity, suggesting lithospheric thinning. This result is not consistent with an extension of the Rio Apa Block beneath the Pantanal Basin. We observed high velocities separating the Pantanal and South-Paraguay seismic zones. The Western Paraná Suture (as proposed by Dragone et al., 2017) shows no correlation with the seismic tomography anomalies. The thick lithosphere in the central part of the Paraná Basin is consistent with deviation of mantle flow, as suggested by SKS fast polarization (Melo & Assumpção, 2018). Synthetic tests show low resolution of the model for structures smaller than 200 x 200 km in the southwest portion of the study area but good resolution for large structures.

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