



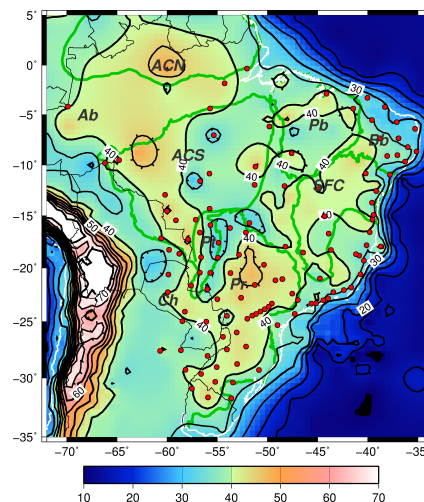
Updated Crustal Thickness map of central South America Based on Receiver Function measurements in the Pantanal and Chaco basins, western Brazil

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Abstract

Previous compilation of crustal structure in South America had large unsampled areas in the middle part of the continent, as the long belt of thin crust in the Sub-Andean lowlands that was mainly estimated indirectly by gravity data and the Amazon Craton that was sparsely sampled by seismic stations. A temporary deployment of 35 seismic stations in southwest Brazil and parts of Bolivia, Paraguay, Argentina and Uruguay filled a significant gap in crustal information in the stable platform. This experiment covers the Quaternary Pantanal Basin in west-center Brazil, the intracratonic Paraná Basin in southern Brazil and part of the Chaco-Paraná Basin in the northeast of Argentina and Paraguay. We estimated crustal thicknesses and V_p/V_s ratios with a modified H-k method by previously producing optimized traces with the three enhanced Moho conversions. This modified method yields lower uncertainties, given by bootstrap resamplings, and shows more regional consistency between adjacent stations. Using the temporary stations and the Brazilian permanent network (RSBR) we better characterized the crustal structure in the study area as follows. The intracratonic Paraná Basin has a thick crust (40-45 km) especially in the northern part and average V_p/V_s ratio (1.71-1.77), compared to the Chaco-Paraná further south with 35-40 km and higher V_p/V_s ratio. Those confirms the lack of widespread significant magmatic underplating in the Paraná Basin that could be related to the origin of the flood basalts during the South Atlantic opening. Our results confirmed a narrow belt of thin crust (30-35 km) with low V_p/V_s (<1.73) to the eastern edge of the Pantanal Basin. In the southern part of the Amazon Craton, to the Rio Apa block in the south, is observed a N-S belt of average to thick crust (40-45 km). The crustal information obtained in this experiment, together with a compilation of recently published data, was used to update the South America crustal thickness map.



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