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MANTLE ANISOTROPY AND ASTHENOSPHERIC FLOW AROUND CRATONS IN SOUTHEASTERN SOUTH AMERICA

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Upper mantle seismic anisotropy is one of the most important means to study dynamics of the Earth's interior. It has been extensively used to infer past and present mantle dynamics and continental evolution. Seismic anisotropy is usually measured by the method of shear wave splitting (SWS), which consists of core refracted phases ((P, S) K(iK)S here nominated XKS phases) that after crossing an anisotropic layer are split into two shear waves with different velocities, giving origin to the splitting parameters: the polarization direction of the fast wave and the delay time between the two waves. Previous studies of SWS in South America concentrated mainly along the Andes and in southeast Brazil. Now we add extra measurements in the area of the Pantanal and Parana-Chaco basins, as part of the FAPESP "3-Basins Thematic Project". With the splitting results of 47 new stations, we presently have a more complete and robust anisotropy map of the South America stable platform. On average, over most of the continent, the fast polarization direction tends to be close to the absolute plate motion given by the hotspot reference model HS3-NUVEL-1A. Nevertheless, new and previously published SWS results suggest mantle flow around the Amazon and São-Francisco cratons. Additionally, we have evidence of flow surrounding a possible cratonic nucleus under the Paraná basin, the Paranapanema block, and thus, confirming its existence. Large delay times at the Pantanal basin may indicate a strong asthenospheric channel, a more coherent flow, or a thicker asthenosphere. Similarly, small delay times beneath the northern Paraná basin may indicate thinner anisotropic asthenosphere.

KEY WORDS: *ANISOTROPY; SHEAR WAVE SPLITTING; ASTHENOSPHERIC FLOW.*