27º Simpósio de Geologia do Nordeste

II Simpósio Brasileiro de Sismologia
NEGO
João Pessoa - 12 a 15 de novembro de 2017

AMBIENT NOISETOMOGRAPHY IN THE PANTANAL, CHACOAND PARANÁ BASINS: INITIAL RESULTS FROMTHE FAPESP "3-BASINS PROJECT"

Taghi Shirzad[1]; Marcelo Assumpção[1]; Bruno Collaço[2]; Marcelo Bianchi[1];
Marcelo Rocha[3] ; Paulo Oliveira[3]
[1] IAG, Centro de Sismologia da USP; [2] IEE, Centro de Sismologia da USP;
[3] Observatório Sismológico, UnB

Surface wave tomography using Green's functions retrieved from ambient noise cross-correlations has become a routine tool in seismological investigations. Here, we obtain information about the crustal and upper mantle velocity structure beneath major intracratonic sedimentary basins in West-Central Brazil (Pantanal, Chacoand Paraná). An anomalously thin crust, about 30 km thick, beneath the Pantanal was suggested by receiver functions (e.g., Assumpção et al., 2013) as well as beneath some parts of the Chaco Basin from surface-wave tomography (Rosa et al., 2016). Thin lithosphere and low upper mantle velocities beneath the Pantanal Basin had been indicated by continental-wide surface-wave tomography (e.g., Feng et al., 2009) and by P-wave tomography (e.g., Rocha et al., 2011). Here we carry out a more detailed tomography using ambient noise cross-correlations in the region of the three basins. In this study, we use continuous vertical- and transverse-components data recorded by the temporary stations of the FAPESP Project (XC network) and permanent stations of the Brazilian network (sub-net BL). The XC and BL networks are equipped with broadband sensors (120s to 50 Hz). We use data from 40 stations for four months (January to April/2017). We first applied a Butterworth Filter between 1 and 100 sec, and then follow the common low frequency approach outlined by Bensen et al. (2007) to prepare single station, which includes one-bit normalization in the time-domain and whitening equalization in the frequency domain. The normalization operators suppress the influence of human activities, instrument irregularities and earthquake signals. We obtained cross-correlation functions for six-hour moving windows displaced every half hour. We stacked all cross-correlations to retrieve inter-station empirical Green's functions, composed mainly of Rayleigh waves (Z-Z cross-correlations) and Love waves (T-T correlations). We then measure the group and phase velocity dispersions using Image Transformation Technique. Finally, we apply the Fast Marching Method and iterative inversion procedure to extract surface-wave tomographic maps.

KEY WORDS: *PANTANAL BASIN, AMBIENTNOISETOMOGRAPHY, SURFACE-WAVEDISPERSION.*