AGU FALL MEETING

San Francisco | 14–18 December 2015

S23D-2780: Surface Wave Tomography of Botswana Using Two-Station and Ambient Noise Analysis

ABSTRACT

Tuesday, 15 December 2015
13:40 - 18:00
Moscone South - Poster Hall

NARS-Botswana is a temporary seismological network of 21 broadband seismometers that is currently being installed in Botswana. Its main purpose is to reveal the subsurface structure and the geodynamical framework of one of the least studied areas in Africa and the world between the Kaapvaal Craton and the Congo Craton. The first one year of data from 15 NARS-Botswana stations in addition to one Africa-Array station and one permanent GSN station was used to make first inferences on the shear wave velocity structure of the crust and the upper mantle.

The data used for this study are Rayleigh wave dispersion curves obtained by two-station and ambient noise analysis for periods between 5-40 s and 10-150 s, respectively. In the two-station analysis, the dispersion curves were estimated using frequency-time analysis of vertical-component cross-correlations of all earthquakes recorded with the same back azimuth at each seismometer pair. In the ambient noise analysis, the dispersion curves were estimated from frequency-time analysis of the empirical Green's functions generated from the stacked cross-correlations of daily seismic records between all seismometer pairs. Finally, a tomographic inversion scheme will be applied using the LSQR algorithm on the dispersion curves to produce phase velocity maps for each period for the studied area.

The first results show interesting variations that indicate strong lateral variations in geodynamics and earth composition throughout the central and southern part of Botswana.

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