Geophysical Research Abstracts
Vol. 19, EGU2017-6678, 2017
EGU General Assembly 2017


# The joint inversion of phase dispersion curves and receiver functions at the margin of East European Craton

Kajetan Chrapkiewicz, Monika Wilde-Piórko, and Marcin Polkowski
University of Warsaw, Faculty of Physics, Institute of Geophysics, Warsaw, Poland (mwilde@igf.fuw.edu.pl)

For the first time a joint inversion of Rayleigh-wave phase velocity dispersion curves and P receiver functions has been applied to study the south-western margin of East European Craton (EEC) in Poland. The area of investigation lies in the vicinity of Trans-European Suture Zone (TESZ) regarded as the most prominent lithospheric boundary in Europe separating the Precambrian EEC from assemblage of Phanerozoic-accreted terranes (e.g. Pharaoh, 1999). While the sedimentary and crystalline crust of EEC's margin has been precisely recognized with the borehole and refraction data compilation (Grad et al., 2016), the structure of lithosphere-asthenosphere boundary (LAB) underneath remains poorly understood. To address this issue, the passive seismic experiment „13 BB Star" (2013-2016) was carried out in northern Poland - just at the margin of EEC. For each station of „13 BB Star" network we obtained a credible 1-D shear-wave velocity model with linearized damped least-squares inversion (Herrmann, 2013) down to the depth of 250 km. The joint inversion of receiver functions and surface-wave dispersion curves has proved to be a natural approach when inferring the nature of cratonic LAB (e.g. Bodin et al., 2014). It's sensitive to both absolute velocities and sharp discontinuities and thus provides a better vertical resolution compared to surface wave data alone. The results indicate the presence of steady 4 per cent grow in the shear-wave velocity between 120 and 180 km depth and gradual 6 per cent drop over 180-220 km depth range. The latter may be interpreted as the LAB with depth and absolute-velocity change similar to those reported for other cratons (Kind et al., 2012). National Science Centre Poland provided financial support for this work by NCN grant DEC-2011/02/A/ST10/00284.