



Upper crustal structure at the KTB drilling site from ambient noise tomography

Ehsan Qorbani (1), Irene Bianchi (2), Dimitri Zigone (3), Petr Kolínský (2), and Götz Bokelmann (2)

(1) International Data Center, CTBTO, Vienna, Austria (eqorbani@gmail.com), (2) Department of Meteorology and Geophysics, University of Vienna, Austria, (3) Institut de Physique du Globe de Strasbourg, EOST, Strasbourg University/CNRS, Strasbourg, France

In this study, we show results from ambient noise tomography at the KTB drilling site, Germany. The Continental Deep Drilling Project, or 'Kontinentales Tiefbohrprogramm der Bundesrepublik Deutschland' (KTB) is at the northwestern edge of the Bohemian Massif and is located on the Variscan belt of Europe. During the KTB project crustal rocks have been drilled down to 9 km depth and several active seismic studies have been performed in the surrounding. Therefore the KTB area is here taken as a sample for testing and verifying the potential resolution of passive seismic techniques. The aim of this study is to present a new shear-wave velocity model of the area while comparing the results to the previous velocity models and hints for anisotropy depicted by former passive and active seismological studies.

We use a unique data-set composed of two years of continuous data recorded at nine 3-component temporary stations installed from July 2012 to July 2014 located on top and vicinity of the drilling site. Moreover, we included a number of permanent stations in the region in order to improve the path coverage and density. Cross correlations of ambient noise are computed between the station pairs using all possible combination of three-component data. Dispersion curves of surface waves are extracted in the 0.07 to 3 Hz frequency band and are then inverted to obtain group velocity maps. We present here a new velocity model of the upper crust, which shows that velocity variations at short periods (down to 12 km depth) correlate well with geology of the region.