Geophysical Research Abstracts, Vol. 7, 04262, 2005
SRef-ID: 1607-7962/gra/EGU05-A-04262

Upper mantle structure in the western Bohemian Massif – results of isotropic tomography and seismic anisotropy (BOHEMA project)

U. Achauer(1), J. Plomerova(2), V. Babuska(2), L. Vecsey(2), M. Granet(1) and BOHEMA Working Group

(1) EOST – Institut de Physique du Globe Strasbourg, France (Ulrich.Achauer@eost.u-strasbg.fr), (2) Geophysical Institute, Academy of Sciences of the Czech Republic, Bocni II/1401, 141 31 Prague 4, Czech Republic (jpl@ig.cas.cz)

The BOHEMA project (BOhemian Massif HEterogeneity and Anisotropy) has brought together geophysicists from 10 institutions in the Czech Republic, Germany and France for a joint study of the structure and dynamics of the lithosphere and asthenosphere in a geodynamically active western part of the Bohemian Massif. An array of seismic stations covered a territory of about 270x150 km, with its long axis oriented perpendicularly to the strike of major tectonic units and to the Eger Rift. The network consisted of 61 permanent and 92 temporary stations operating between October 2001 and the end of 2003, with a core of recordings in 2002 (Plomerova et al., 2003). Three-component short-period stations represent about 1/3 of the network, while broad-band stations constitute the remaining 2/3. Spacing of stations was generally less than 30 km, while in the central part of the array the station spacing was as small as 10-15 km, hence allowing for a lateral spatial resolution of approx. 20km in the upper mantle. The BOHEMA project aims at showing an existence or non-existence of a mantle plume beneath the Eger Rift, similarly to what has been established for several rifts (e.g., in Massif Central, Eifel) belonging to the European Cenozoic rift system, which may have a common source of volcanism in the mantle (Granet et al., 1995). Preliminary results of the P-velocity tomography do not image any distinct magma chamber or a mantle plume. On the other hand, the tomography indicates an asthenospheric upwelling beneath the region of Marianske Lazne. However, we are at a stage of incorporating new measurements, which may change the final image. Besides isotropic velocity tomography, intensive research of

body wave anisotropy is conducted. Evaluated parameters of seismic anisotropy are inverted jointly to retrieve 3D self-consistent anisotropic model of the upper mantle, particularly of different mantle lithosphere domains. Both P- and S-wave anisotropy show two different orientations of the large-scale fabric in the Saxothuringian and the Moldanubian (Babuska and Plomerova, 2002) with a transitional type in the northern part of the Tepla-Barrandian.