



Velocity structure of the upper mantle beneath the north-eastern Bohemian Massif (central Europe)

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We present a 3-D velocity model of the upper mantle beneath the northern and eastern parts of the Bohemian Massif (BM) based on data from passive seismic experiment BOHEMA II (May 2004 - June 2005) during which 35 temporary stations operated in the region. The recordings of permanent observatories in central Europe were also included into the study. For the teleseismic tomography we selected 203 events with epicentral distances between 25° and 90° and magnitude higher than 4.5. We corrected the observed travel-times for the crustal structure using the 3D model of the BM crust (Karousova et al., *Studia geophys. geod.*, submitted). We test the model parameterization to be sure it does not affect the resulting perturbations and compare velocity perturbations retrieved from two types of regularizations: singular value decomposition and damped least-square method. We prefer the model from the damped least-square method, because amplitudes of the anomalies are smoother without very local small-size heterogeneities due to irregular ray geometry and a horizontal block size 30-by-30 km. In order to explore the resolution in individual nodes, we performed checkerboard and synthetic tests. After four iterations the variance reduction of the resulting model is 84%. Most of velocity perturbations of the model lie in range of $\pm 2.5\%$. The northern BM is characterized by low-velocity perturbations, particularly beneath the Saxothuringian and Sudetic parts. At depths from 80 to 250 km velocities increase towards the Moldanubian part of the BM, similarly to findings from experiment BOHEMA I (2001-2003), which concentrated on the upper mantle structure of the western part of the BM (Plomerova et al., 2007). The low velocities also dominate in the upper mantle beneath the whole BM down to the depths of ~ 250 km in regional tomography by Koulakov et al. (2009) and Piromallo and Morelli (2003). Spakman (personal communication) maps low velocities beneath the BM down to 400 km in a new global P-wave tomography. All the three last-mentioned studies are based on data of permanent observatories only. The high-resolution tomography from data of passive experiment BOHEMA II did not reveal any additional distinct velocity variations in the upper mantle beneath the north-eastern BM.