Abstract details

8196 - Geophysical investigations of the Eastern Alpine crust and upper mantle			
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Title	**Geophysical investigations of the Eastern Alpine crust and upper mantle**		
Abstract	Currently the deep structure of the Eastern Alps and their surroundings is intensively studied by several large-scale geophysical investigations. We present latest results and ongoing projects. The 3D seismic refraction experiments CELEBRATION 2000 and ALP 2002 delivered much new insight into the P-wave velocity distribution of the crust and the structure of the complex Moho boundary in the area. In both experiments, seismic waves generated by 55 and 39 blasts, respectively, were recorded each with approximately 900 recorders. The results are a 3D velocity model of the crust, a new Moho depth map and 2D interpretations along selected profiles. The most important outcome is the determination of a pronounced fragmentation of the crust, including the new interpretation of the crustal block Pannonia which may be related to Miocene-to-date extrusion tectonics. Based on these results, the ALPASS experiment was launched to investigate the structure of the upper mantle down to the 660 km discontinuity. 110 permanent and 79 temporarily deployed stations recorded earthquake waveforms in the time from May 2005 to April 2006. These data provide the input for surface wave inversion, receiver functions, and teleseismic tomography. Seismic recodings from 144 earthquakes have been selected for a teleseismic tomographic inversion. A preliminary first model of the P-wave velocity structure of the upper mantle will be presented. Of particular interest is the direction of subduction below the Eastern Alps , since previous investigations yield contradicting results. Magnetotelluric soundings targeting the crust have been performed in the frame of the DIMS project. Ten test measurements with different instruments were carried out along the Hungarian-Austrian border. Another 33 measurements followed a seismic profile from the Hungarian border toward NW. Preliminary results indicate low resistivity of sediments in the Graz Basin in the SE part of the profile, as opposed to the highly resistive Eastern Alps in the NW. Large-scale tectonic fractures appear as conductive dikes. The long period soundings along the Hungarian-Austrian border might delineate the asthenosphere. We conclude that all three projects deliver much new insight into the deep structure of the investigated area. The joint interpretation of the existing and forthcoming models will contribute to a better understanding of the complex geodynamic processes that took place in the Eastern Alps .		
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