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PASSEQ 2006-2008 - Passive Seismic Experiment in Trans-European Suture Zone in Central Europe

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The PASSEQ 2006-2008 project (PASsive Seismic Experiment in TESZ) focuses on understanding the deep seismic structure across the transition between the old Proterozoic platform of north and eastern Europe and the younger Phanerozoic platform in central Europe. The experiment was only possible thanks to a great international effort that involved 17 institutions from Europe and the USA. A total of 139 three-component temporary short-period and 49 temporary broad-band seismic stations provided continuous recordings between May 2006 and June 2008 with the main period of recordings during 2007, along about 1200 km long and 400 km wide array running from Germany through the Czech Republic and Poland to Lithuania. The average spacing between all stations was about 60 km, attaining about 20 km in the central part. The configuration of the seismic network was a compromise among needs of different seismic methods. The dense central profile allows the use of modern passive 2-D imaging techniques, while the distribution of broad-band sensors was designed for surface wave and receiver function studies of the upper mantle down to the transition zone in a wide frequency range. The configuration will allow us to evaluate 3-D structures. The array also includes permanent stations of the national observatories within the area of the experiment. All raw data from temporary seismic stations are archived in their original formats on at least two different media and in two sites. Additionally, all continuous data have been converted to the miniSEED format and along with transfer functions for sensors and data loggers (dataless volumes) are stored at the GEOFON Data Center in Potsdam. It has bee agreed that all continuous data will be available for members of the PASSEQ Working Group exclusively for three years after the database is completed, and then will be open to the scientific community. Data from the dense array of stations will allow us to map the upper mantle structure, e.g., the contrast, sharpness and topography of seismic discontinuities, with much higher resolution than previously. We expect to reveal variations of seismic velocities within the upper mantle around the contact zone of the Proterozoic platform and younger mobile belts down to the transition zone by applying body- and surface-wave tomography, as well as the receiver function techniques. Analysis of shear wave splitting of teleseismic SKS waves and analysis of P residuals and converted waves will resolve variations of anisotropy across the TESZ. Joint inversions of independent datasets will provide more realistic 3-D models of the upper mantle than single methods. We will present data examples and initial results from SKS splitting, surface wave and receiver function analysis.