

Shear-wave velocity structure and geodynamics in Balkan Peninsula region

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Lithosphere-asthenosphere system in Balkan Peninsula region, defined as the shear-wave velocity structure to the depth of about 350 km, is obtained for 132 cells (sized 1degree by 1degree). The models are obtained by the following sequence of methods and tools: surface-wave dispersion measurements and collection; 2D tomography of dispersion relations; non-linear inversion of cellular dispersion relations; smoothing optimization method to select a preferred model for each cell. The distribution of seismicity and other geophysical information is used as independent constraints for the definition of the crustal and lithospheric thickness. The obtained picture of the lithosphere-asthenosphere system for the Balkan Peninsula region confirms a strongly heterogeneous structure of the crust and mantle. The focal mechanisms of the strongest earthquake (if there are and with magnitude greater than 3.0) for each cellular model are defined. For the determination of the earthquake focal mechanisms is used the method of the P wave first motion polarities and the FOCMEC program. Data from the Bulgarian Seismic Network, available free waveform from the ORFEUS database, ISC and EMSC catalog data are used. Obtained solutions, with relevant force axes, are related to the different rheologic-mechanic properties of the Earth's structure in the region.