New insights into the lithosphere beneath the Romanian seismic network from Rayleigh wave dispersion and receiver function analysis

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We present new models of shear wave velocity structure of the crust and upper mantle beneath Romanian broad band stations. The data set consist in more than 300 teleseismic earthquake with epicentral distance between 30° and 95°, magnitude greater than 6 and a signal-to-noise ratio greater than 3 for the P-wave pulse. Most epicenters are situated along the northern Pacific Rim and arrive with backazimuths (BAZs) between 0° and 135° at the Romanian seismic network. We combine the receiver functions with fundamental-mode of the Rayleigh wave group velocities to further constrain the shear-wave velocity structure. To extract the group velocities we applied the Multiple Filter Technique analysis to the vertical components of the earthquakes recordings. This technique allowed us to identify the Rayleigh wave fundamental mode and to compute the dispersion curves of the group velocities at periods between 10 and 150 s allowing us to resolve shear wave velocities to a depth of 100 km. The time-domain iterative deconvolution procedure of Ligorrıa and Ammon was employed to deconvolve the vertical component of the teleseismic P waveforms from the corresponding horizontal components and obtain radial and transverse receiver functions at each broadband station. The data are inverted using a joint, linearized inversion scheme which accounts for the relative influence of each set of observations, and allows a trade-off between fitting the observations, constructing a smooth model, and matching a priori constraints. All models fit well their individual data sets. This highlights the point that the inversions are not unique. The upper mantle velocities for the receiver function inversion are too large, while the surface-wave inversion lacks any detail about the Moho. These particularities are corrected in the joint model proving the reliability of the results. The results show a thin crust for stations located inside the Pannonian basin (28-30 km) and a thicker crust for those in the East European Platform (36-40 km). The stations within the Southern and Central Carpathian Orogen are characterized by crustal depths of ~35 km. For stations located in the Northern part of the Eastern Carpathians we found a crustal depth of 32 km. For stations located in the Apuseni Mountains the Moho discontinuity is replace by a transition zone extended between 36 and 40 km depth. For a station located in the Carpathians bent area we identify a double Moho (32 respectively 44 km depth) possible due to the Vrancea subduction process. For the crust of Moesian Platform we get higher values (~35 km) compare to those obtained from seismic refraction profile (VRANCEA'2001). The North Dobrogea crust reaches a thickness of about 44-46 km. For most of the stations the crust-mantle transition zone has a significant gradient, with velocity values varying from 3.8 to 4.7 km/s. Our results are compatible with those obtained from previous studies.

An olistolith with continuous latest Bajocian to late Cenomanian pelagic deposition within the Bornova Flysch Zone in western Turkey: Radiolarian Assemblages

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Bornova Flysch Zone (BFZ) comprises several olistoliths or tectonic slivers, representing the lithosphere of the Izmir-Ankara Ocean and accretionary melange complexes formed during its closure. Radiolarian assemblages in one of the olistoliths in BFZ, to the NE