SECOND EUROPEAN CONFERENCE ON EARTHQUAKE ENGINEERING
AND SEISMOLOGY, ISTANBUL AUG. 25-29, 2014

ATTENUATION OF BODY AND CODA WAVES IN THE CENTRAL DINARIDES

Iva DASOVIĆ[1], Marija RUŠČIĆ[2], Marijan HERAK[3] and Davorka HERAK [4]

The Dinarides are situated in the broad Africa-Eurasia convergent plate boundary zone. Due to the push of the African plate, the Adriatic microplate collides with the European plate in the north (the Alps), and is underthrusting the Dinarides to the northeast. The main deformational phase for the Dinarides is Paleogene N–S shortening and dextral lateral compensation. This resulted in characteristic NW trend and SW vergence of compressional and imbricated structures. Because of its complexity, the area is considered as one of the geologically and tectonically most complicated and puzzling regions in Europe. Recent seismicity, varying from moderate to high, also depicts prevailing compressional stresses with mainly reverse faulting.

In order to estimate attenuation characteristics of the Central Dinarides, we used local earthquakes recorded at seismological BB-stations of the Croatian seismological network. We focused on the attenuation of high frequency body and coda waves. To estimate attenuation of body waves, i.e. the quality factors Q_P and Q_S, we applied the extended coda normalization method. These quality factors reflect the attenuation of the body waves in the upper crust. The coda-Q method was employed to calculate the quality factor of coda waves, Q_C. Attenuation of the coda waves describes total attenuation, which includes both elastic energy conversion into heat (intrinsic absorption) and energy redistribution of waves scattered on the heterogeneities (scattering). It describes attenuation of the much larger and deeper medium, reaching into the uppermost mantle, than it does for body waves.

Observed attenuation is high and the quality factors display pronounced frequency dependence. In general S-waves are more attenuated than P-waves. Coda-Q factors show lapse time dependence which could be explained with depth depended rock properties controlling attenuation. Our results indicate heterogeneous to very heterogeneous crust.

Obtained results will hopefully enable better estimates of the seismic moment of local and regional earthquakes.

[1] Department of Geophysics, Faculty of Science, University of Zagreb, Zagreb, Croatia, dasovici@gfz.hr
[2] Department of Geophysics, Faculty of Science, University of Zagreb, Zagreb, Croatia, marija.ruscic@gmail.com
[3] Department of Geophysics, Faculty of Science, University of Zagreb, Zagreb, Croatia, herak@irb.hr
[4] Department of Geophysics, Faculty of Science, University of Zagreb, Zagreb, Croatia, herak@irb.hr