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Mapping the geophysical bedrock of the Moesian Platform using H/V ratios and borehole data.

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The strong effects at long periods observed in the extra-Carpathian area of Romania during large Vrancea intermediate-depth earthquakes were explained by the influence of both source mechanism and mechanical properties of the geological structure. Complex basin geometry and the low seismic velocities of the sediments are the primary responsible for the large amplification and long duration of the seismic records from the extra-Carpathian area during intermediate-depth earthquakes.
The aim of this study is to map the geophysical bedrock of this area correlating and interpolating the results obtained from local resonance phenomena evaluation with the available surface geological data. The site was investigated through the computation of H/V spectral ratios from three-directional single station measurements of ambient vibration.
The first step was to estimate the depth of the geophysical bedrock at all the Romanian seismic stations located in the extra-Carpathian area (velocity sensors) using the fundamental frequency retrieved from the H/V curves. In the second stage of the study all the relevant peaks from the H/V curves were interpreted in consonance with the available information of the geology.
The geological data were obtained from the database developed in the national BIGSEES project by National Institute of Earth Physics. In this database are integrated all the geological, geophysical data from all the past projects, contracts, studies (as refraction, reflexion, etc.), geotechnical drillings and other information publicly available.
The mapping of the geophysical bedrock was done interpolating the geological database and information gathered/resulted from H/V using a geographical informational system(GIS).
The geology of this area displays very complex features as outcrops in small zones/lines/ near the Danube and then is gradually dipping to about 2 km depth in the N-NE.
The depth of the bedrock is (nearly) constant around 100 m depth on the right side of the Danube (which crosses the Moesian Platform from West to East, parallel with Meridional Carpathians). On the left side of the Danube, in Southern Romania, the bedrock is dipping to the North, towards the mountains(Meridional Carpathians).
The bedrock is interpreted as the Neogene - Cretaceous interface and lefts its mark on the frequency content the seismic ground motion by the long period propagating waves.