

-Dimensional Velocity Model at the Bending of the Southern Carpathians, Inferred from the Analysis of Local Earthquakes

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The purpose of this study is to improve the hazard model and the accuracy of the Romanian earthquake catalogue (ROMPLUS) by determining the one-dimensional (1-D) velocity model in a complex collision setting at the bending of Southern Carpathians. To achieve this aim, we investigate 314 low to moderate-sized local, crustal events (M_w 1.0 - 3.4) that occurred from 2019 to 2021. The waveforms were recorded by the permanent stations of the Romanian Seismic Network (RSN) over a distance of up to 200 km. The P and S wave travel times determined in the selected distance range were inverted using the VELEST algorithm and the IASP91 velocity reference model. The resulting high precision 1-D velocity model and the station corrections were further used to relocate the seismic events recorded in ROMPLUS catalogue within the selected area. Our results provide a significant decrease in RMS location errors and, in agreement with previous findings, show a good correlation with local geological structure. Consequently, the relocated events place key constraints on natural seismicity patterns, representing the first step towards more detailed seismotectonic analyses.

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Promotional text

We built a new crustal velocity model using a local earthquake data set recorded by RSN. New velocity model can help to enhance the monitoring capability and be useful in better discriminating between natural and anthropogenic seismic events in Romania.

Oral preference format

in-person

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