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Seismicity Detection in Skopje Region Using Tomographic Methods and 3-D Modelling

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A novel geotomography technique has been applied at the epicentral area around capitol of Macedonia - Skopje, using selected earthquakes that occurred over a period of 57 years and were recorded on temporary and permanent seismograph stations. This study will test the tomography method for the first time in investigation of the crustal shape and structures in our tectonic environment using specially designed datasets covering 1964-1967 and 2016-2020 periods.

In the initial phase, the analysis will show the potential of the geotomography application in revealing detailed velocity perturbation in the lithosphere. Then, the events are relocated in the 3-D models and new cross-sections of the crust produced by a simultaneous approach. The images can help in constraining the velocity vs depth relationship and thus can contribute towards redefinition of the earthquake zones. The results are discussed in terms of general stress and seismic regime and their temporal changes.

Better understanding of the seismicity and tectonics processes in the Skopje region will lead to an overall improvement of the earthquake hazard assessment at local and national level, as well as further integration in research programs with other geophysical methods.