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Local Earthquake P-wave Tomography of Central and Western Slovenia

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A P-wave tomography study of central and western Slovenia is presented. In the last 20 years, the number of permanent digital broad band seismic stations in the seismic network of the Republic of Slovenia has grown from 6 to 28. The stations are placed at the low noise locations and they recorded large set of earthquakes. In spite of the large amount of new high quality digital data that is available, the last published tomography study of Slovenia was done in 1998 [1]. There are a few recent tomographic studies that include north-western parts of Slovenia [2,3], but their focus is on north-eastern Italy.

The main motivation for the present study is to improve the knowledge about the P-wave velocity variations beneath the Alps and the Dinarides in Slovenia and to compare the results with the existing studies. We use the *Simulps14* software, developed by Thurber [4] and improved by many others, e.g., Um and Thurber [5], Eberhart-Phillips [6], and Haslinger [7]. More than 10 000 P arrival times originating from over 500 earthquakes, well recorded by more than 45 stations in Slovenia and surrounding area are included in the study. The time span of the data is from 1996 on and only the manually determined P arrival times are retained.

The approach in the study is rather standard. First we determine the starting 1-D velocity model using the catalogue locations of the earthquakes that are determined by the routinely done analysis employing the average 1-D velocity model for Slovenia. Next the 3-D P-wave velocity model is determined on a set of horizontal layers (separated by 3 to 5 km) together with the relocation of the hypocentres of the earthquakes used in accordance with the 3-D velocity model. The preliminary results show reasonable agreement with the existing study by Michelini at al. [1], but we expect to gain better resolution and finer details by further adjusting the model parameters such as grid dimensions, starting 1-D model, elimination of inconsistent arrival times, etc.

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