

EGU2020-16663

<https://doi.org/10.5194/egusphere-egu2020-16663>

EGU General Assembly 2020

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Relocation of seismicity of the Pannonian Basin using the Bayesloc multiple event location algorithm between 1996 and 2019

Barbara Czece^{1,2} and István Bondár²

¹Eötvös Loránd University, Department of Geophysics and Space Science, Budapest, Hungary (barbara.czece@ttk.elte.hu)

²Research Centre for Astronomy and Earth Sciences, Geodetic and Geophysical Institute, Kövesligethy Radó Seismological Observatory

The objective of this work was to relocate the entire seismicity of the Pannonian Basin with the Bayesloc algorithm, a Markov-Chain Monte Carlo inversion scheme using a Bayesian statistical framework.

In the Hungarian National Seismological Bulletin the magnitudes and event locations are determined with the iLoc location algorithm using the 3D global RSTT velocity model, and we used these locations as initial coordinates. In our work, we have used all of the instrumentally registered seismic events between 1996 and 2019 in the Pannonian Basin.

During data preprocessing we used graph theory to measure data connectivity. Similar to all multiple-event location methods, Bayesloc performs better when events are recorded on a common network.

We used several hundreds of ground truth events (quarry blasts, mine explosions, earthquakes) to tie down the seismicity pattern to known ground truth locations by giving them tighter prior distributions.

Based on the day-time peak on the origin-hour distribution of the bulletin earthquakes we assume that there are anthropogenic events labeled as earthquakes in the catalog, therefore we created a „Suspected explosions (SX)” group to set prior constrains.

The results show that the events around the mines are dramatically better clustered. The prior constraints contributed remarkably to the outcome of the relocation. We show that the results present an improved view of the seismicity of the region.