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Seismic monitoring aimed at intermediate-term prediction of strong earthquakes in the Vrancea region

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A comparative analysis of earthquake catalogues available for the Vrancea region of intermediate-depth seismic activity, i.e., the USGS/NEIC Global Hypocenter Data Base, the local Vrancea seismic catalogue, and the RomPlus catalogue of earthquakes compiled at the National Institute of Earth Physics resulted a conclusion that these data is suitable for monitoring the times of increased probability of strong (magnitude 6.0-6.9) and major (magnitude 7.0-7.9) earthquakes in the region by means of the intermediate-term earthquake prediction algorithm M8 or its modification dating back to 1986. The application involving the original version of the M8 algorithm, which has passed the control test in global real-time experiment, 1992-present, and RomPlus data, which level of completeness and availability guarantees such an application, has the priority in setting the real-time prediction experiment in the region. The observed excess of strong and major earthquakes indicates above-critical state of seismic activity experienced in the region recently. The retrospective simulation of seismic monitoring shows that with the best data available the methodology allows to identify (although retrospectively) three out of the four strong (magnitude 6 or larger) earthquakes. We setup and are starting the real-time prediction experiment in the Vrancea region from January 2007. As of January 1, 2007, the M8 algorithm trailing measures of seismic activity are in their highest values recognizing that the region entered recently the time of increased probability for a strong (or even major) earthquake. The results are stable to variations of data, different definitions of mainshocks, magnitude of the target earthquakes, and other parameters of the M8 algorithm.