



An algorithm for the short-term prediction of the mainshock from foreshocks

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Foreshock activity has been considered as one of the most important earthquake precursory phenomena since at least 70's. This is because of the particular features of the foreshock sequences. In particular, the number of foreshocks increases with the inverse of time while the b-value usually drops with respect to the b-value of the background seismicity. Statistics of the Greek seismicity indicates that at least 50% of the mainshocks of $M_s \geq 5.5$ are preceded by foreshocks and that foreshock sequences occur as a rule within a time interval no longer than four months before the mainshock. The recognition of the onset of a foreshock activity in near real-time is of importance to issue warning for a forthcoming stronger mainshock. To this aim we developed a computerized procedure for the automatic recognition of foreshock activity in near real-time. The system consists of an earthquake data basis, an algorithm which performs the statistical tests, and a decision matrix which indicates the level of alert. The data basis is automatically updated from the results of the daily analysis of the national monitoring seismograph system. The algorithm updates calculations regarding seismicity rate and b-value changes and performs statistical tests for the significance of change. The decision matrix calculates the level of alert by companying together the level of significance for both the seismicity rate change and the b-value change. Actual application of the system on real-time basis is scheduled to start very soon after the completion of several tests for retrospective foreshock recognition. This is a contribution to the EU research project SAFER, contract n. 036935, FP6-2005-Global-4, Reduction of Seismic Risks.