

EGU2020-20053

<https://doi.org/10.5194/egusphere-egu2020-20053>

EGU General Assembly 2020

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Short-term retrospective forecasting of earthquakes based on temporal variations of the b-value of the magnitude-frequency distribution

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In some recent works it has been hypothesized that the slope (b-value) of the magnitude-frequency distribution of earthquakes may be related to the differential stress inside the crust. In particular, it has been observed that low b-values are associated with high stress values and therefore with high probability of occurrence of strong seismic shocks. In this paper we formulate a predictive hypothesis based on temporal variations of the b-value. We tested and optimized such hypothesis retrospectively based on the homogenized Italian instrumental seismic catalog (HORUS) from 1995 to 2018. A comparison is also made with a similar predictive hypothesis based on the occurrence of strong foreshocks.