A grid-based b-value approximation through Southern and Northern Norway: preliminary results

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The Gutenberg – Richter's b-value is commonly used to analyze the frequency-magnitude distribution of earthquakes, describing the proportion of small and large seismic events as the first estimation of seismic hazard. Additionally, the b-value has been used as a stress meter, giving some insights into the stress regime in different regions around the world. In this research, a grid-based spatial distribution for the b-value was estimated in three different areas of Norway: northern (74°-81° N/ 12°-26° E), southern (57°-64°N/3°-12° E), and the ridge zones of Mohns and Knipovich. For this, we used a complete catalog from the years 2000 to 2019, which was obtained from the Norwegian National Seismic Network online database. The magnitude of completeness was estimated separately for each zone both in time and space, covering a total area of ~425,000 km². Our results show a regional variation of the mean b-value for northern (b_{north} = 0.79) and southern (b_{south} = 1.03) Norway, and the Ridge (b_{ridge} = 0.73), which can be interpreted in terms of the predominant stress regime in the different zones. So far, a few calculations regarding the b-value were previously done in Norway to analyze local intraplate sequences. Then, according to our knowledge, this research corresponds to the first estimation of a regional spatial variation of the b-value in the country.