



Effect of earthquake slip-area scaling on b-value ranges

Piotr Senatorski

Institute of Geophysics, Polish Academy of Sciences, Warsaw, Poland (psenat@igf.edu.pl)

The Gutenberg-Richter law's b-value breaks symmetry between small and large earthquakes. Derived dependence between the b-value and rupture area vs. slip scaling exponent is a link between earthquake statistics and physics. The relationship enable us to explain observed ranges of b-values for different types of earthquakes. Specifically, different b-value ranges for tectonic and induced, hydraulic fracturing seismicity is explained in terms of their different triggering mechanisms: by the applied stress increase and fault strength reduction, respectively. Stochastic model of seismicity, based on the von Neumann's acceptance-rejection method, illustrate the findings.