

Prior distribution of b-value in Gutenberg-Richter formula for the aftershock sequence (2) - aftershock sequences in the world -

Masami Okada[1], Hidemi Ito[2]

[1] Matsushiro Seismo. Obs., [2] Seismology and Volcanology Research Dep., M.R.I.

We estimated a prior distribution of the b-value in Gutenberg-Richter formula from 81 aftershock sequences in the world from 1968 through 1999 by using the maximum likelihood method, supposing that the true b-value follows the distribution of Gamma(ϕ, ζ). The parameters of prior distribution, ϕ , and mean of b value, $b_{\text{mean}} (= 0.4343 * \phi * \zeta)$ are closed to 50 and 1.13, respectively. ϕ -value obtained in this study is the same as the one in a previous result for aftershock sequences in and around Japan, but b_{mean} is a little larger than the one in the case of Japan. Under the condition of prior distribution of Gamma(ϕ, ζ) the b-value for a sequence of N events is given with the harmonic mean of b_{mean} and unbiased estimate, b_u , which are weighted by ϕ and N, respectively.