

Parameter Estimation for the Omori's Law.

José Frez,

Depto. de Sismología, División de Ciencias de la Tierra, CICESE.

jofrez@cicese.mx

From the three parameters of the generalized Omori's law $n(t) = \frac{K}{(c+t)^p}$ (Utsu,

1961), only p is usually estimated and used in the literature, with some general references to difficulties in determining K . In this work, we analyze six aftershock sequences for moderate earthquakes ($M_L = 5.5-6.7$) taken from the catalogs of Southern California and Northwestern of Baja California and determine the three parameters. The likelihood function and the weighted quadratic norm of the residuals are used as criterion (cost) functions. Concerning numerical methods, the optimal likelihood value is calculated by direct and genetic searching as well as by application of a variable metric method. A weight proportional to the square root of the frequency is applied for the least squares method. In general terms, the resulting procedures produce similar results. A small sensibility of the criterion functions for estimating the parameter K and high correlation for the pairs $\{K, p\}$ and $\{K, c\}$ are reported. For the analyzed data, it is not possible to neglect the hypothesis that the parameter c is null. The estimated values of p associated with earthquakes that occur in the Mexicali Valley are larger than the ones for both the Peninsular Ranges and the Continental Borderland.