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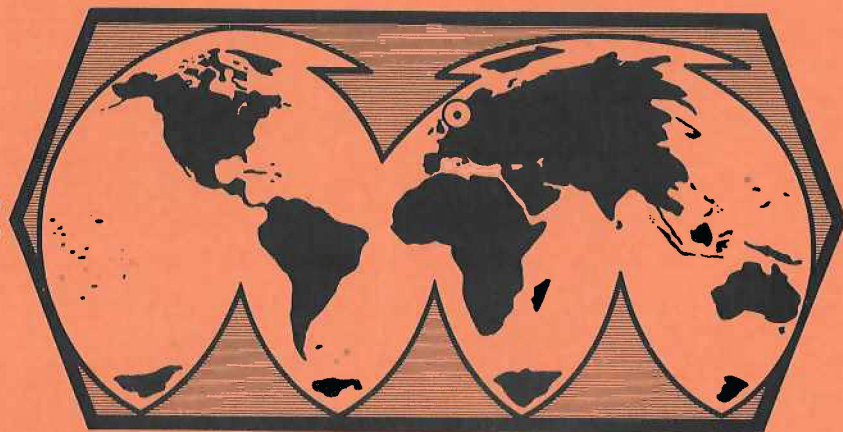
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N. A NEW QUANTITATIVE MEASUREMENT OF SEISMICITY

The seismicity of various regions and the methods for estimating this has been the subject of intensive studies by numerous seismologists. The magnitude-frequency relation of Gutenberg-Richter (1944) which is accepted as the most generally valid may be expressed as follows:

$$\log n(S_Q, T, M) = \alpha_0(S_Q, T) - bM$$

where n is the number of earthquakes with magnitude $\geq M$ in the seismic region Q with area S_Q in a time period of T years.

Normalizing n per unit of space and time gives:

$$\log N(M) = \log A_k - b(M - M_k)$$

where M_k is a threshold magnitude. The parameter A_k has been used as a quantitative measure of seismicity when $b \approx$ constant. In reality b is, however, not constant and may vary between 0.5 and 1.5. It thus follows that neither A_k nor b can be used separately to measure the seismicity if b is different in two regions.

In the new method, a world mean standard magnitude-frequency relation with b standard = 1 has been established both for the case when surface wave magnitude or body wave magnitude are used. Correspondingly the mean standard frequency activity A_S when M is greater than μ is given by

$$A_S = 10^{-0.41} \cdot 10^{-(M-\mu)}$$

The new quantitative measure of seismicity called 'the relative level of seismicity' is given by

$$L_k^{RS} = \frac{A_k}{A_S}$$

when $M_k \geq \mu$.

The application of the method is demonstrated by Purcaru (1974).

G. Purcaru

REFERENCE

Purcaru, G. (1974): A new quantitative measure of seismicity and some related aspects, in a special issue of "International Symposium on Seismology and Physics of Solids of the Earth's Interior", Jena (DDR), 1-6 April 1974, in press.