



## **AN APPROACH TO EXAMINATION OF THE RARE STRONG EVENTS DISTRIBUTION LAW AND THE REGIME OF THEIR OCCURRENCES**

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Empirical distribution of strong events of different type has rather frequently a power-law character of distribution. This feature is typical of the earthquakes size values, loss values from earthquakes and other strong natural hazards, and in a number of other important cases in economics and in sociology including. In a number of cases the power-law character of distribution appear takes place for the rare strongest events only, this is probably the case of floods. The power-law (self-similar) character of distribution is believed to be typical of highly non-equilibrium dynamic systems and can realize in result of the development of the positive feed-back in a regime of events development. Thus, the examination of the character of distribution gives possibility to determine does the system under examination can be treated as a quasi-equilibrium one or it has an essentially non-equilibrium behavior. Thus, the character of behavior of systems can be closely connected with the the distribution law of rare strong events occurring in this system. Because of a limited number of rare strong events (that appears to be a typical case) the routine statistical procedures can be ineffective in determination of character of distribution of such events, and other methods should be used. To characterise the distribution of rare strong events the Gnedenko-Pickands-Balkema-de Haan theorem was used, and some results obtained are discussed. The similar examination can be realized using the spectral analysis approach. The results obtained for a number of cases from different fields are discussed. The Gnedenko-Pickands-Balkema-de Haan theorem was used also for the evaluation of probability of occurrence of rare strongest events. The examples for the case of the strong earthquake occurrence are presented.