Possibility between earthquake and explosion seismogram differentiation by discrete stochastic non-Markov processes and local Hurst exponent analysis

Yulmetyev R., Gafarov F., Hänggi P., Nigmatullin R., Kayumov S.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The dynamic, kinetic, and spectral properties of seismic signals depicting earthquake (EQ) and technogenic explosion (TE) modulation were studied using two methods: one based on seismograms considered in the form of a discrete non-Markov statistical process, and another on the generalized conception of the Hurst exponent. These methods enabled to explicitly determine some features of several different states of the Earth's crust: states of the Earth before and during strong and weak EQs, during TEs. The two methods allowed to present the seismogram analyzed in the form of a set non-Markov variables and parameters.