



Wavelet analysis of well thermograms as a new instrument for ecological hazard studies

D. Khristoforova

Kazan State University, Russia (daria.khr@mail.ru/007-843-2924454)

Very important information on the ecological catastrophes and hazards can be acquired through the wavelet analysis of well thermograms. As it appears from temperature vs. depth curves (thermograms), the temperature distribution depends on the deep heat flow, thermal conductivity of rocks, the value and directions of the mass transfer in them, and other factors, and provides critical information on the thermal regime of the Earth including its catastrophic changes. I analyzed the 3D wavelet body of more than 200 thermograms. The temperature distribution in any well contains temperature waves. Temperature waves are spatial temperature variations in the rock mass. Spatial temperature waves are considered to be a feature of the Earth's thermal regime and their analysis provides a new instrument for the ecological hazard studies. All wells have individual mode structures of thermograms with time-constant characteristics, such as wave length, amplitude and phase. The wave amplitudes in natural thermograms may vary from several degrees to fractions of a degree. The wave amplitudes with several tens of degrees in the well thermograms are associated with the ecological hazards and catastrophes. These are related to the thermal pollution of the environment: lithosphere, hydrosphere, Earth's surface and, consequently, atmosphere. Revealed thermal pollution may be responsible for the climate warming.