



Use of Wavelet- Analysis for simultaneous Data Processing of 3-Component active seismic Monitoring

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The paper presents results of simultaneous area 3-component seismic data processing from man-caused explosions with use of wavelet amplitudes of space-time distributions of the medium response as a parameter of seismic heterogeneity on man caused explosions in quarries. The received results show the opportunity of man-caused explosions use as a part of the active monitoring of geological medium state.

By research of the dynamics of the high complicated geological medium the defining of factors, which are sensitive to it's changing for a chosen system of observation play a significant role. At present there is changing in the model presentation about the medium structure: from layered and flat-laying and good reflected structures to discrete hierachic or so-called heterogenic structures, which in the wave field are characterized mainly by scattered non regularly waves, which are characterized by space-time focusing features. The shift to a new class of models is needed for the first time not for mapping 3-D structures, but for research of the dynamic features and structure state and forecasting it's dynamics.

We suggest a new processing method with use wavelet-analysis of the space-time 3 component active seismic monitoring data. As a parameter for the analysis we use the wavelet presentation of the parameter of seismic heterogeneity, calculated from horizontal components of seismic data. We suggest a new parameter: function or curve of stability, which is define from the distribution of correlation coefficients of wavelet presentations of the parameter of seismic heterogeneity for a pair of consistent explosions. For that parameter we made a classification of the stability state for different places of the geological medium for each point of observation. If the value of that parameter is higher, the researched block for that point of observation is more stable. That conclusion is based on the geological and geotectonic information. The second parameter of pair wise space correlation of the stability functions allowed us to construct gradations for the degree of potential non stability of the medium researched blocks. These gradations had been compared with the geological heterogeneities on different time scale levels. In the industrial regions that method can be used as an additional part of the active seismic monitoring of the geological medium state. That method is developed for use as an additional part of the joined geophysical method for forecasting of the medium state dynamics.

Wavelet-analysis, parameter of seismic heterogeneity, active seismic monitoring, man-caused explosions.