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Research of dynamical Characteristics of slow deformation Waves as Massif Responses on Explosions

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The research of massif state with use of approaches of open system theory [1-3] was developed for investigation the criterions of dissipation regimes for real rock massifs, which are under heavy man-caused influence. For realization of that research we used the data of seismic catalogue of Tashtagol mine. As a result of the analyze of that data we defined character morphology of phase trajectories of massif response, which was locally in time in a stable state: on the phase plane with coordinates released by the massif during the dynamic event energy E and lg(dE/dt) there is a local area as a ball of twisted trajectories and some not great bursts from that ball, which are not greater than 105 joules. In some time intervals that burst can be larger, than 105 joules, achieving 106 joules and yet 109 joules. [3]. Evidently there are two reciprocal depend processes: the energy accumulation in the attracted phase trajectories area and resonance fault of the accumulated energy. But after the fault the system returns again to the same attracted phase trajectories area. For analyzing of the thin structure of the chaotic area we decided to add the method of processing of the seismic monitoring data by new parameters. We shall consider each point of explosion as a source of seismic or deformation waves. Using the kinematic approach of seismic information processing we shall each point of the massif response use as a time point of the first arrival of the deformation wave for calculation of the wave velocity, because additionally we know the coordinates of the fixed response and the coordinates of explosion.

The use of additional parameter-velocity of slow deformation wave propagation allowed us with use method of phase diagrams identify their hierarchic structure, which allow us to use that information for modeling and interpretation the propagation seismic and deformation waves in hierarchic structures. It is researched with use of that suggested processing method the thin structure of the chaotic area for two responses of the massif on a high energetic explosion in the northern and southern parts of it. The results are significant for understanding the high energetic rock shock and evaluation a criterion for massif stability estimation.

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Key words: massif response, slow deformation waves, seismic mine catalogue, analyze of observed data, phase diagrams.

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