

PLANETARY HYDROGEN DEGASSING, CONTROLLING A SELF-SUSTAINED TRIGGER SEISMIC PROCESS IN A WIDE RANGE OF DEPTHS

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Convincing evidences of the deadlock of the discontinuous model of the seismic process have been obtained.

The evidences are based on the real features of the structure and dynamics of the geological environment: the maximum energy saturation of the medium to the Moho boundary and its permanent instability, the absence of acts of destruction in the seismic process in the lithosphere, rapid changes in the parameters of the medium observed in variations of structurally sensitive seismic wave velocities in the lithosphere, variations in the velocities of seismic waves in the upper mantle, the periodicity of deep-focus seismic events (DfSE), the rapid reaction of the surface lithosphere to the preparation and course of deep-focus seismic events.

The key to understanding seismic situations in the lithosphere and upper mantle was the problem of the nature of DfSE and their repeatability.

DfSE cannot be associated with rapid polymorphic or phase transitions in a wide range of depths, as well as with the processes of local accumulation of elastic energy. The mechanical nature of the DfSE is absurd in principle.

On the basis of new ideas about the geological environment, a degassing model of the seismic process controlled by planetary hydrogen degassing was substantiated. Models of crustal seismic acts and DfSE are proposed. For the lithosphere, these are rapid movements along the boundary structures, for the DfSE - an "explosive" release of hydrogen as embedding atoms, causing deformation of the hydrogen sublattice. The driving forces of the wave seismic process in the lithosphere, which is extremely energy-saturated in elastic energy, are the floating deformation waves of a diffusive nature, activated by continuously ascending hydrogen flows, providing a self-sustaining seismic process.

The trigger action of hydrogen fluxes on the parameters of boundary structures is realized, which control slow (background mode) or fast movements of the elements of the medium relative to each other (weak events - in the background mode). Hydrogen activation of boundary structures translates the process of movement of the elements of the medium relative to each other into a barrier-free process with features of superplasticity. We emphasize, and it is proved, that trigger effects in an extremely energy-saturated environment only due to the force action of elastic waves of seismic sources cannot independently activate the seismic process, since their energy is significantly less than the energy of thermal fluctuations. At the same time, the ascending flows of light gases can be controlled by weak elastic waves of microseisms or weak seismic events in interaction with lunar-solar tides, which affects the dynamics of the background seismic process. Manifestations of the strongest and mega events occur with additional activation of boundary structures by hydrogen flow due to local activation in the upper mantle of Vadkovsky's "seismic nails". For these events, Vadkovsky's "seismic nails" are also a trigger that changes the parameters of boundary structures in the lithosphere. The epicentral zone of possible strongest events can be identified in the short-term period of seismic danger.