

Granular media mechanics and deformation mechanism of some East European platform geological objects

Leonov M.G.

Geological Institute of RAS, Moscow, Russia

e-mail: mgleonov@yandex.ru

The problem of granular and crystalline rocks 3D deformation as well as mechanisms of their inner mobility has been a focus of structural geology study.

The crystalline rock masses 3D mobility can be fixed into the East European platform basement and cover thanks to some characteristic features such as change their external shape without breaking the continuity of a boundary surface as well as infrastructure defects that defines the strike-slip tectonics, formation specific piercing structures kind of protrusions.

The internal structure of such bodies is defined by a discrete granular-block structure, which varies on a large scale from micro- to mega-level. In geology, media of this kind are represented by some igneous body (primarily granites), marbles and quartzite, loose deposits (sands and aggregations of gravel, pebbles, and boulders) and some other rocks, which used to be considered as monolithic, although their integrity is not self-evident (e.g., metamorphic schists and gneisses). In opinion of some experts, even the aggregation of lithospheric plates can be regarded as a granular medium.

The change of morphological and spatial position of such bodies has been accompanied by internal clastic structure of rocks, which acquires the appearance and properties of granular substances. Investigation of granular media is one of high-priority directions in the modern science (works of I.A. Garagash, S.V. Goldin, V.N. Nikolaevskiy, A.F. Revuzhenko, C.S. Cambell, T.G. Drake, A. Mehta, H.M. Yaeger, S.R. Nagel, others). According to definition, a granular medium corresponds to aggregation of numerous solid particles, interstices between which are filled by fluid, water, air, also clastic breccia, mikroclastites. Physics of granular media has been applied already in sedimentology, structural geology, and tectonics. Internal connectivity of monolithic domains higher than rock connectedness as a whole. Body with a granular structure becomes a "viscous-fluid" and acquires the ability to 3D flow in solid state. Volume mobility is a fundamental property of block substances (G.G. Kocharian's works).

The report reviewed some cover and basement complexes of the East European platform, which the structural features also mechanisms of formation find an explanation from the mechanics of granular substances position.

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