

# **Dynamic process modeling in non-elastic sediment structures of the Black Sea region**

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Understanding tectonics and geodynamics of the Black Sea region requires some knowledge of crustal structure presently nearly unknown. The second we suggest here the dominant deformation mechanism in the ductile part of the lithosphere and non-elastic sediment structures is creep that can be modeled as a viscous phenomenon. We explore idea the Black Sea to be a Neogene or Quaternary graben-like gap within the continental crust. The thickness of the sediments suggested Paleozoic or Upper Pre-Cambrian age. The Black Sea frame is tectonically heterogeneous. Regional structures have different crustal ages and geological nature. The western basin is thought to have formed in an earlier Cretaceous phase by rifting in the stable Moesian platform and subsequent seafloor spreading. So the new approaches to understanding geodynamic processes in various time scales are needed. So the general formulation of a problem of elastic waves propagation in disordered geological structures with zones of the stored up long-term viscous-plastic deformations is given. The statistical approach of multicomponent geodynamics is considered, the detailed attention is given to a question of interdependence and interference of elastic, viscous and gravitational characteristics of the media under consideration. The possibility of allocation in non-uniform geological structure of the characteristic representative volume possessing effective properties is basic hypothesis of various theories of homogenization we use here. Such assumption forms a basis of geodynamic model and takes a possibility to use it for detailed and profound analysis of static and dynamic problems for not quite elastic or perfectly plastic geological structures.

We consider here the presence of visco-plastic areas in a zone of a plane wave propagation by introducing in the model an additional microvolumes with strongly contrast elastic fields. Then according to results of our previous works we use equations of movement of multicomponent geological structures with rheological properties. We investigate here the random structures and use statistical region data received as a result of geophysical monitoring. The solution of statistical problem may form a basis for geodynamic processes in non-uniform structures modeling with scale characteristics of three levels: the linear sizes of object of monitoring, the sizes of elements of internal structure and distances between a source and the signal receiver. Depending on parities of these sizes it is recommended to use the theory of the static effective elastic modules led to some volume of averaging or the theory of dynamic elastic modules or the equation of statistical dynamics of the non-heterogeneous media with reference to the analysis of ensemble of physical realizations of process.