Geophysical Research Abstracts Vol. 21, EGU2019-6091, 2019 EGU General Assembly 2019 © Author(s) 2019. CC Attribution 4.0 license.



Results of vibro- and microseismic studies of mud volcanoes in Northwestern Caucasus

Alexey L. Sobisevich (1), Irina N. Puzich (1), and Zalim I. Dudarov (2)

(1) Schmidt Institute of Physics of the Earth Russian Academy of Sciences, Schmidt Institute of Physics of the Earth, Moscow, Russian Federation (alex@ifz.ru), (2) The Geophysical Survey of the Russian Academy of Sciences, Obninsk, Russian Federation

The results of multidisciplinary geological and geophysical studies of mud volcanism in the Northwestern Caucasus (Taman mud-volcanic province) are presented. Comparative analysis of results of geophysical data interpretaion on the deep subsurface structure of several mud volcanoes obtained by means of vibroseismic methods on one hand and by microseismic sounding approach with respect to previous studies has demonstrated advantages of the ambient noise seismic prospecting. It has been shown that subvertical pathways of fluid migration and so feeding systems of mud volcanoes represent nearly-ideal case of local geological heterogeneities affecting the amplitudes of low-frequency microseismic noise. The analysis of the results was performed with respect to available geological as well as geomorphological data. On the other hand, active seismic experiments with controlled vibroseismic sources followed by mathematical simulation provides more detail on velocity structure of layered medium and may be also used for theoretical modelling of the processes of hydrodynamic outflow under various mechanisms of mud volcanic eruptions. For several mud volcanoes there were outlined subvertical feeding structures in sedimentary layers and deeper in the crust, responsible for fluid migration and eruptive activity. Specific features of volcanic products (gas components and mineral inclusions in breccia) were analyzed with respect to the new geophysical data obtained.