



Results of study of deep underground structure of mud volcanoes in North-Western Caucasus by means of geological and geophysical methods

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Results of complementary geological and geophysical studies of mud volcanic phenomena in North-Western Caucasus (Taman mud volcanic province) are presented.

New technology for passive subsurface sounding of the Earth's crust has been originally developed at the Schmidt Institute of Physics of the Earth, Russian Academy of Sciences. Patented since 2005, this technology represents the new kind of seismic survey based on specific features of propagation of the Rayleigh waves. It uses natural background microseismic noise as a sounding signal. By using the method of low-frequency microseismic sounding in the course of field works carried out in 2006 – 2008, there have been obtained three vertical cross-sections for the two mud volcanoes down to the depth of 25 km. For the two different mud volcanoes their deep subsurface structure has been revealed and discussed.

The Gora Karabetova mud volcano is one of the most active mud volcanoes in the Taman peninsula with primarily explosive behaviour while the Shugo mud volcano's activity pattern is different, explosive events are rare and both types of phenomena may be explained by the configuration of their feeding systems, tectonic position and deep pathways of migration of fluids. Complementary interpretation of raw data sets delivered from geophysical and geological surveys allows considering principal differences of origin and mechanisms of mud volcanic activity for the Shugo and the Gora Karabetova mud volcanoes.