

# SEISMIC HAZARD ASSESSMENT IN THE AREAS OF MUD VOLCANOES LOCATION ON THE BASIS OF GEOPHYSICAL DATA

*Ismail-Zadeh Tofik*

*United Institute of Physics of the Earth, Russian Academy  
of Sciences, Moscow, Russia*

*E-mail: [moskow@geon.msk.su](mailto:moskow@geon.msk.su)*

Remarkable features of the South Caspian basin are its high hydrocarbon potential as well as mud volcanism occurring in a large portion of the basin and active seismicity of its surroundings. Earthquakes may result in a destruction of marine platforms or pipelines and hence in ecological catastrophes. To prevent the catastrophes, a stability of bottom marine sediments with respect to strong ground motions should be analysed. The analysis consists of the following elements: (i) to determine natural remnant magnetisation and its demagnetisation under an alternating magnetic field; (ii) to find thermal demagnetisation of remnant magnetic saturation [ $I_{rs}(T^\circ)$ ] and absolute (inductive) magnetic saturation [ $I_s(T^\circ)$ ]; and (3) to determine the Curie point (magnetic transition temperature) and temperature of phase transformations  $T_p$ . Relative errors of  $I_{rs}$  and  $I_s$  measurements are within 3%. Also densities of bottom marine sediments are to be determined. The methodology is tested on samples of the Pleistocene and Upper Pliocene sediments. The samples are selected from cores of nine boreholes drilled in Garasu and Bulla-deniz uplifts. Three paleomagnetic zones are distinguished in the subcrops of the boreholes: the first zone is associated with the Etruscan event of reversed polarity (2.7 to 3.0 Ka), the second one with the Goeteborg event (10 to 12 Ka), and the third zone with the Blake event (109 to 114 Ka). These events correspond to the New Caspian, Upper Khvalynsk, and Upper Khazarsk horizons of the Pleistocene stratigraphic scale. Irregular levels of magnetic susceptibility reduction in the subcrops are likely to reflect vertical displacements at different sides of faults. The developed methodology can be employed for a regional and local zoning of bottom marine sediments based on a stability of regions with respect to strong ground motions as well as for analysis of directions of modern tectonic movements.