Geological environment monitoring based on synchronous borehole geoacoustic and electromagnetic measurements: the use of natural electromagnetic radiation

V.A. Gavrilov[1], E.V. Poltavtseva[1], A.V. Desherevsky[2],
Yu.Yu. Buss[1], Yu.V. Morozova[1]

[1] *Institute of Volcanology and Seismology FEB RAS, Petropavlovsk-Kamchatskii, Russia*
[2] *Schmidt Institute of Physics of the Earth, Russian Academy of Sciences, Moscow, Russia*

Abstract. The results of synchronous geoacoustic and electromagnetic measurements at three boreholes located in the Petropavlovsk-Kamchatskii area with different electromagnetic environment are studied. We suggest that reliable registration of geoacoustic emission responses to the natural electromagnetic radiation impact in the range of 0.01–1.0 kHz is possible when geophones are placed in sufficiently deep boreholes. The results are shown that the use of natural extremely low frequency electromagnetic radiation is perspective for monitoring of stress-strain states of geological environment.

Keywords: borehole, geoacoustic measurements, natural electromagnetic radiation, monitoring, geological environment.