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Seismoacoustic observations using a seismic array on an ice floe

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We present the results of seismoacoustic wavefield geophysical measurements carried out at Lake Baikal in the winter of 2020. A system of six special autonomous geo-hydroacoustic buoys, capable of continuously functioning at least for a week, was used as measuring equipment. Each individual buoy consists of a recording system, a seismometer-velocimeter, a hydrophone and wireless data transmission facilities. The measuring system was placed on an ice surface of the lake, forming a seismic antenna system. Lake depth at the locations of some buoys reached 400 m, the ice thickness was 1 m. As a result of experimental data processing, the arrival times of several local earthquakes were identified on ice seismograms. This allows one to study the process of seismic energy transformation into hydroacoustic and back. In addition, a hydroacoustic signal generated by the operation of a distant 100-ton seismic vibrator was recorded in deep water under ice conditions. It can be concluded that geohydroacoustic buoys have demonstrated the convenience and high reliability of use in severe winter conditions. Thus, the possibility of placing seismic arrays on drifting ice floes in the Arctic for solving problems of seismoacoustic monitoring can be considered confirmed.

Promotional text

The possibility of application ice monted seismic arrays for seismoacostic monitoring is demonstrated

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