

Seismoacoustic observations using molecular-electronic hydrophones on Sakhalin and the South Kuril Islands (Kunashir Island)

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Abstract. The article presents the main characteristics and studies spectral and recording capabilities of experimental samples of three types of molecular-electronic hydrophones with different sizes of electrochemical converting cells, which were installed in the central part of the south of Sakhalin Island and on Kunashir Island (southern part of the Kuril ridge) at the end of 2018. A hydrophone on a new technological basis (with an increased sensor sensitivity relative to previously conducted studies) was approved on Kunashir Island. Equipment of this type was used for observations on the territory of the Sakhalin region for the first time. As a result of continuous seismoacoustic observations on Kunashir Island, in seven cases out of 35 studied (from May 1, 2019 to February 29, 2020) earthquakes, a low-frequency anticipatory signal (LFAS) was detected, and all seven events had a depth of hypocenter of more than 80 km. In the area of the Central Sakhalin fault, in addition to the possibility of registering the LFAS, spectral features in the recording of waveforms were studied for different conditions of instrument installation. It is shown that the influence of such atmospheric factor as wind load significantly affects hydrophones located in a shallow water body and a shallow open borehole. It is shown that the influence of such atmospheric factor as wind load significantly affects hydrophones located in a shallow water body and a shallow open borehole. However, molecular-electronic hydrophones have demonstrated the ability to fully record seismic events regardless of the installation conditions of the equipment.

Keywords:

seismoacoustic observations, molecular-electronic hydrophone, spectral density, seismic events, low-frequency anticipatory signal

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