



Monitoring of slow seismic events from Arctics using the data of the POLENET/LAPNET broadband temporary array

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Monitoring of slow glacial seismic events from Greenland at regional distances was one of the major targets of the POLENET/LAPNET passive seismic experiment in northern Fennoscandia (northern parts of Finland, Sweden, Norway and Russian Karelia) during the IPY 2007-2009. The POLENET/LAPNET array, with the average spacing between stations of 70 km, recorded high-frequency continuous data of 37 temporary stations, which were in operation during the time frame from 01.05.2008 to 31.09.2009, and of 21 stations of selected permanent networks in the Fennoscandia. Most stations of the array were equipped by broadband STS-2 seismometers. Glacial events from Greenland were identified using manual analysis of the continuous POLENET/LAPNET data filtered by a bandpass filter from 35 s to 140 s frequency band. The detected events were located using standard array techniques. Our study proves that glacial earthquakes in Greenland show a strong seasonality, with most of events occurring during summer months in 2007, 2008 and 2009. The detected slow events have their origins not only at marine-terminated glaciers, but also in offshore areas of Greenland. As the epicentres of these events are located mainly in the areas with high speed of ice flow, they could be due to interaction of ice sheet with solid bedrock. However, they could also be tectonic events. We also identified and located a number of slow events originating from marine-terminated glaciers in Svalbard. In addition, the array detected a number of slow earthquakes from northern part of Mid-Atlantic Ridge, the vicinity of Svalbard, Jan Mayen Island and Arctic Canada. However, no slow earthquakes from Iceland were recorded during the POLENET/LAPNET data acquisition period. Our result shows that analysis of recordings of broadband stations in low frequency band can provide new information not only about temporary changes in Greenland Ice Sheet, but also about seismicity and spreading processes in the Mid-Atlantic Ridge and other areas of Arctics.