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Basic Research on Seismic and Infrasonic Monitoring of the European Arctic

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This research is aimed at improving seismic and infrasonic monitoring tools at regional distances, with emphasis on the European Arctic region, which includes the former Novaya Zemlya test site. The recent upgrade of the Spitsbergen seismic array (SPITS), which has included an increase in the sampling rate from 40 to 80 Hz, has made possible significant improvements in high frequency signal characterization. Our studies have shown a remarkably efficient wave propagation from events near Novaya Zemlya across the Barents Sea to SPITS. Significant signal energy at frequencies up to 30 Hz and above has been observed, even for seismic events below magnitude 3 at an epicentral distance of more than 1000 km. In order to investigate if this same efficient propagation could be observed at the ARCES array in northern Norway, we have recently installed additional recording equipment, with a sampling rate of 100 Hz. Our initial results are similar to those seen at Spitsbergen.

We are also carrying out joint seismic-infrasonic studies of events in the European Arctic, applying the data from the current seismic and infrasonic array networks in northern Europe. As a special case study, we have compared seismic and microbarograph recordings at the ARCES seismic array, using three experimentally installed microbarographs at the array site to supplement the seismic recordings. Results from this comparison will be presented.