



Upgrading the Northern Finland Seismological Network

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The Finnish National Seismic Network (FNSN) comprises national Helsinki University Seismological network (HE) ISUH and the Northern Finland Seismological Network (FN) hosted by the Sodankylä Geophysical Observatory (SGO) of the University of Oulu. The FN network currently consists of four real-time permanent stations equipped with Streckeisen STS-2 broad band seismometers that are recording continuous digital seismic data. At present, the network is a part of GEOFON Extended Virtual Network and of the ORFEUS Virtual European Broadband Seismograph Network. In the future, the network will be the part of EPOS-European Plate Observing System research infrastructure. As a part of EPOS project activities, the SGO started to upgrade their own network in 2014. The main target of the network upgrade is to increase the permanent station coverage in the European Arctic region, particularly behind the Polar Circle. Another target is to transform the network into a broadband seismic array capable to detect long-period seismic signals originating from seismic events in the Arctic.

The first upgrade phase started in 2014, when two new stations were installed and now are working in the test regime. These stations are used as prototypes for testing seismic equipment and technical solutions for real-time data transmission and vault construction under cold climate conditions. The first prototype station is installed in a surface vault and equipped with Nanometrics Trillium 120P sensor, while the other one is installed in a borehole and equipped with Trillium Posthole seismometer. These prototype stations have provided to us valuable experience on the downhole and surface deployment of broadband seismic instruments. We also have been able to compare the capabilities and performance of high sensitivity broadband sensor deployed in borehole with that deployed in surface vault. The results of operation of prototype stations will be used in site selection and installation of four new stations during 2016-2017.