グリーンランド氷床における広帯域リアルタイム地震観測網の構築

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Construction of a broad-band realtime seismic network on the Greenland ice sheet

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The GLISN (GreenLand Ice Sheet monitoring Network) is an international project to seismologically monitor changes in the Greenland ice sheet, by deploying a large broadband seismograph network in and around Greenland. This project is currently managed through joint collaboration by 11 countries for operating 32 seismic stations, although only four of them are on the ice sheet. Japan is a partner country from when the project was launched, and has been sending a field team every year since 2011. A joint USA and Japanese GLISN team has ever serviced three stations on ice sheet (station code: ICESG, DY2G, and NEEM) and also three stations on bedrock at the coastal area (NUUK, SOEG, and DBG), which indicates a great effort of this team among the whole GLISN committee.

In this year, two members (Dean Childs and Genti Toyokuni) participated in the field operation to service five stations during Aug. 6-27 (see Fig. 1). The team upgraded firmware of global-access remote-control modems (Xeos XI-100B) utilizing the Iridium satellite network, which made it success in realtime transmission of broad-band seismic data (20 sps) at all three ice stations. It is the first time in the world that the seismic data with such a high sampling rate is transfered from the ice sheet. The data is now open to the public, and available from the IRIS Data Management Center (http://www.iris.edu/ds/nodes/dmc/). This presentation will summarize our 2014 field activities, and show examples of the retrieved waveform.

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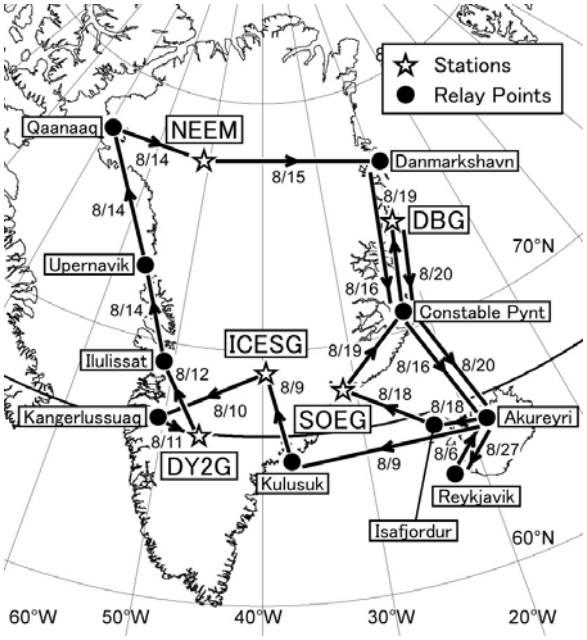

Figure 1 (left). Schedule and route map of the 2014 GLISN field operation by the joint USA and Japanese team. Observation base was located in Akureyri, Iceland, and a Twin Otter was chartered for flights between stations. Stars indicate stations serviced in this year, while filled circles indicate relay points for refueling.

Figure 2 (bottom). Comparison of network traffic at station DY2G between before and after the 2014 field service. Before the maintenance, only long period data (1 sps) was transmitted at every 8 hours a day, whereas after the maintenance, both long period and broad-band data are transmitted in realtime.