

Occurrence frequency of lee-side downslope winds near Siorapaluk in northwest Greenland

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In early April 2018, Niwano et al. (2018) conducted the scientific traverse expedition “Snow impurity and glacial microbe effect on the abrupt warming in the Arctic (SIGMA) Traverse 2018”. The expedition crews had initially planned to depart Siorapaluk on April 2, 2018. However, their departure was delayed by four days because of strong winds and snow blocking the way. Numerical experiment showed that the strong wind had characteristics of a lee-side downslope wind (Hashimoto et al., 2018). Matoba and Yamasaki (2018) reported a sea ice outflow event and its damage to fishery along the coast of Qaanaaq (50-km southeast of Siorapaluk) in early December 2016, which was the first time experience for residents of Qaanaaq over the last 30 years. They assumed that northeasterly winds of more than 30 ms^{-1} on 6-hour average dispersed sea ice from the coast, based on observation data at Qaanaaq airport.

These strong wind events seriously affected the scientific activity and residents’ living, which motivate the authors to study occurrence characteristics of strong winds in the northwest Greenland. According to observation performed during 2016-2017 and 2017-2018 winter seasons in Siorapaluk, strong winds more than 15 ms^{-1} occur in several times. These winds are always from the north-northeast to the observation point, which means that these winds blow beyond the ridgeline in the north of Siorapaluk. Year-round observation in Qaanaaq shows that strong winds appear also in summer as well as in winter. Some strong wind events are found to occur simultaneously in Siorapaluk and Qaanaaq. Numerical simulations are conducted for the period from May 2017 to April 2018 by using the Japan Meteorological Agency’ s non-hydrostatic model (JMA-NHM) with the 1-km horizontal resolution to reveal temporal and spatial distributions of strong winds and mechanisms causing them. Statistical features of strong winds and dynamical connections between synoptic and local wind systems will be presented in the meeting.

References

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