



Boundary layer measurements at Cape Baranov

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The generation of new data sets of in-situ observations of the (ABL) in the high Arctic is necessary for the verification of regional climate models and process studies of the ABL. We performed measurements of the ABL structure for more than one year (start Oct. 2017, planned until Sept. 2019) at the Russian station Cape Baranov (79°18'N, 101°48'E), which is one of the northernmost observatories in the Arctic.

ABL measurements were made using a SODAR (Sound Detection And Ranging), a RASS (Radio Acoustic Sounding System) and large-aperture boundary layer scintillometer (BLS). The SODAR yields vertical profiles of the wind speed, wind direction and the turbulence characteristics with a vertical resolution of 10m and a temporal resolution of 15-20min. The RASS extension allows for the determination of the temperature profile with the same resolution. In addition, the BLS was used to measure line-averaged sensible heat fluxes.

Results of the measurements for the first year are presented. The height range of the SODAR wind profiles was typically around 400m (mean data availability 50%), temperature profiles from RASS are generally available for the lower 300m. A stably-stratified ABL is typical for wintertime conditions, but only few strong low-level jets were found. A topographical channeling effect for the wind field can be seen in the lowest 100m with the highest frequency of strong winds (larger than 10 m/s).