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The atmospheric boundary layer during the Arctic Ocean 2018 expedition

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For the Arctic Ocean 2018 expedition, the Swedish research icebreaker Oden left Longyearbyen on Svalbard on 1 August and traversed the Arctic Ocean to reach the North Pole on 12 August. The Oden was equipped with an extensive array of in-situ and ship-based remote sensing meteorological instruments. During one month, 14 August to 14 September, Oden was moored to and drifted with a 1.5-by-0.7 km ice floe around N89° E40° and additional measurements were taken from site on the ice. The expedition ended in Longyearbyen on 21 September. During the expedition, and especially during the ice drift, we monitored an atmospheric column from the ice through the whole troposphere. On board we deployed in-situ instruments, such as an advanced weather station and eddy covariance instruments that allowed monitoring of the components of the surface energy budget. We also deployed a scanning Doppler cloud radar, a scanning Doppler lidar and a microwave profiler, and launched 6-hourly radiosondes to monitor the structure of the Arctic atmospheric boundary layer. Additionally, on the ice during the ice drift, a suite of micrometeorological observations was taken, with eddy covariance and mean profile instruments deployed on several masts and meteorology, turbulence, and radiation instruments flown on tethered balloons.
In this presentation we will show some preliminary results from the expedition, including the development of the surface energy budget from the late summer melt to the start of the autumn freeze up, and of the vertical structure of the boundary layer including the cloud properties.