# WindLiDAR measurements in the Arctic boundary layer

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Since December 2012 the AWI-Potsdam operates a commercial wind-lidar (WindCube 200, Leosphere, France) on the roof of the AWIPEV observatory in Ny-Ålesund which runs unattended and continuously. It uses the Doppler effect of an eyesafe laser at 1.5 µm wavelength to measure the 3-dimensional vertically resolved wind with typically 10min temporal resolution. The resolution in altitude is 50m. Its range depends on weather conditions and can reach up to 5km. Between 200m and 800m data coverage so far is about 97%.

In the first part of this contribution we validate its performance against the wind measurements of our radiosonde and the tethered balloon. Apparently, the wind-lidar is able to capture the wind speed well and the wind direction even better than the Vaisala TTS111 tether-sondes. The correlation between the windspeed measured by the radiosonde and the windspeed measured by the wind-lidar is 0.95. For the winddirections, the correlation is 0.78. However, the fact that the radiosonde drifts with the wind while the wind-lidar measures stationary above the observatory challenges a direct comparison at high wind speeds.

In the second part a statistical analysis of the wind in Ny-Ålesund for winter (and hopefully summer as well) is given. The omnipresent wind shear in Kongsfjord (at the surface the wind blows frequently from E-SE and rotates between 500m and 800m altitude to its synoptic flow) is discussed. During winter and spring additionally jets are observed which can last up to several hours. An overview of jet occurrences and their relation to surface based inversions is given.