



Behaviour of surface layer turbulent fluxes as a function of micro-meteorological conditions at Ny-Alesund - Svalbard

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The atmospheric numerical models present some limitations in correctly representing the Polar Atmospheric Boundary Layer in Svalbard region because of the complexity of orography of the area. Direct measurements of turbulent parameters are requested to verify the validity of the parameterization used in these models and get better comprehension of the processes occurring at the interface air - soil/snow interface. The Amundsen-Nobile Climate Change Tower (CCT) (high 32 m) installed in September 2009 at Ny-Alesund (Svalbard) close to the Dirigibile Italian station has been instrumented with standard meteorological sensors of wind speed and direction, air temperature and humidity at four level. Since March 2010 a sonic anemometer is also operational at 6.5 m a.g.l. to perform direct measurements of turbulent fluxes using the eddy covariance technique. The behaviour of fluxes as a function of the wind and temperature fields has been studied. The turbulent fluxes have been classified according to the different stability conditions.

The turbulent data have been used to check if they obey to the similarity theory in order to estimate the quality of the boundary layer parameterizations generally used in atmospheric models. Finally, the surface turbulent fluxes have been estimated with the gradient technique and compared with the sonic anemometer measurements, in order to explore the possibility to use a simpler technique to measure surface turbulent fluxes.