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A ”dirthy” almost-neutral surface layer

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This contribution investigates the vertical structure of the almost-neutral surface layer and its behavior both in high and low winds conditions.

In this aim, observations acquired on the Climate Change Tower in Ny-Ålesund, Svalbard Islands, are considered. The 30-m high tower, operated by the Italian National Research Council (CNR) in cooperation with Korea Polar Research Institute (KOPRI), is equipped with four meteo- and three micro-meteorological levels and is located on heterogeneous terrain.

The work focuses on the relation among the shape of the wind profile, the measured vertical momentum flux and the vertical velocity variance, considering their dependence on height: i.e., the departures from the constant-flux-layer conditions, highlighting the transition towards low-winds.

Finally, an interpretation of the observed behavior in terms of flux-gradient relationship with a suitable eddy diffusion coefficient is given.