



Offshore Wind and Turbulence Profiles from the FINO1-Mast

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Offshore mean wind and turbulence profiles from FINO1 data will be presented and the characteristics of the marine boundary layer will be analysed.

FINO1 is a unique 100m high mast on an offshore research platform with a minimum distance of 45km to the nearest coast operating since October 2003. Cup anemometers are installed in 8 heights from 30 to 100 metres and additionally ultrasonic anemometers in three heights. At selected heights other parameters like temperature, humidity and radiation are available.

Vertical profiles of wind speed from the cup data show significant differences to profiles at onshore sites, especially lower vertical gradients. Profiles will be shown at different stability classes defined by Gradient-Richardson-Numbers.

It is found that measured turbulence intensity is about fifty percent lower than turbulence intensity at flat onshore sites. Average profiles of turbulence intensity are nearly constant with height which suggests that the top of the Prandtl layer is at most times lower than 30m.

Vertical profiles of the gust factor which will also be presented show a slight decrease with height.

Both turbulence intensity and gust factor increase with increasing wind speed above 10-12m/s. This can be attributed to the increasing wave heights at these wind speeds.