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## Design Wind and Sea Loads for Offshore Wind Turbines

The exploitation of offshore wind energy involves new challenges in structural design of wind turbines. In order to design robust and efficient wind machines it is necessary to have good knowledge of the dynamic loads on the structure and turbine blades. Such loads involve wind shear, turbulence, waves and current. The large turbine dimension of offshore wind turbines also represents challenges related to dynamic loads caused by the high wind shear. Wind characteristics of offshore winds differ from onshore conditions where most available wind data exists and it is therefore desirable establish time and space correlations of open sea winds and waves.

The research activity will be focused on collecting and analysing wind data from onshore sites exposed to open sea wind conditions. Based on both long and short time scale data the project aims to determine design conditions for wind and sea loads on offshore wind turbines. Field data will be collected from a measurement station at Titran with masts equipped with advanced wind measurement instruments and with the possibility to include wind lidar, scintillometer and offshore buoys. The site at Titran is especially suited for measurement of offshore winds from the north and the west and has a minimum of 10km of open sea over an angle of 225 degrees.