



The offshore wind resources assessment application of floating LiDAR in the Taiwan Strait

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Wind and wave measurements of a Floating LiDAR (Light Detection And Ranging) Device (FLD) are performed on the site of Fuhai Offshore Wind Farm in the Taiwan Strait. The location of the deployment is situated 10 kilometers off-coast of Changhua County, and the anchored water depth is 25 meters. It is the very first time in Asia Pacific Region to use such device for tasks of offshore wind and wave measurement. Six range gate heights were set at 55m, 71m, 90m, 110m, 150m and 200m from the FLD sensor lens. Wind speeds and wind directions were measured by a remote sensing technology. Wave heights and periods were also measured by the buoy wave sensor. A validation campaign of NCKU WindSentinel has performed by a portable LiDAR (WINDCUBE v2) at Hsing-Da Harbor in the south of Taiwan from October 16th to 26th, 2013. The results showed good agreements with 10 minute averaged data of the wind speed and wind direction measured by the two LiDARs. NCKU WindSentinel data are planning comparisons with Fuhai's offshore fixed mast data when the meteorological mast is completed. The goal is to convince the wind energy community that FLD are a reliable and cost effective way of obtaining data for resource assessment. Until this moment, The FLD are observing and measuring the offshore wind farm's meteorological and oceanographic data. In September of 2014, a mild typhoon (Fung-Wong) passed through from east of Taiwan. NCKU WindSentinel continuously measured during typhoon period in the sea. The present preliminary measurements campaign presented the convenient and more cost effective option of the FLD, which may be a key tool for assessment of offshore wind resources in the near-future offshore wind farm developments.