

Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Evaluation of the sphere anemometer for atmospheric wind measurements¹ HENDRIK HEISSELMANN, JOACHIM PEINKE, MICHAEL HOELLING, ForWind - University of Oldenburg — Our contribution will compare the sphere anemometer and two standard sensors for wind energy and meteorology based on data from a near-shore measurement campaign. We will introduce the characteristics of the sphere anemometer - a drag-based sensor for simultaneous wind speed and direction measurements, which makes use of the highly resolving light pointer principle to detect the velocity-dependent deflection of sphere mounted on a flexible tube. Sphere anemometer, cup anemometer and 3D sonic anemometer were installed at near-shore site in the German Wadden Sea. A comparison of the anemometers was carried out based on several month of high frequency data obtained from this campaign. The measured wind speed and direction data were analyzed to evaluate the capability of the sphere anemometer under real operating conditions, while the sensor characteristics obtained from previous wind tunnel experiments under turbulent conditions served as a reference to assess the durability and to identify challenges of the new anemometer. A characterization of the atmospheric wind conditions at the test site is performed based on the recorded wind data. Wind speed and wind direction averages and turbulence intensities are analyzed as well as power spectra and probability density functions.

¹Supported by the German Ministry of Economics and Energy.

Hendrik Heisselmann
ForWind - University of Oldenburg

Date submitted: 01 Aug 2014

Electronic form version 1.4