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**Wind speed and direction measurements using the sphere anemometer** HENDRIK HEISSELMANN, MICHAEL HOELLING, JOACHIM PEINKE, University of Oldenburg & ForWind — In times of growing energy demand, the importance of wind energy is rapidly increasing and so is the need for accurate wind speed and direction measurements. The widely spread cup anemometers show significant over-speeding under turbulent wind conditions as inherent in atmospherical flows while being solely capable of detecting the wind speed. Therefore, we propose the newly developed sphere anemometer as a simple an robust sensor for direction and velocity measurements. The sphere anemometer exploits the velocity-dependent deflection of a tube, which is the order of $\mu$m and can be detected by means of a light pointer as used in atomic force microscopes. In comparative measurements under laboratory conditions the sphere anemometer showed a significantly higher temporal resolution then cup anemometers while it does not exhibit any over-speeding. Additionally, results of atmospherical wind measurements with the sphere anemometer and state-of-the-art cup anemometry are presented.

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