



Improvement of Sonic Wind Measurements by Multi-Path Technology

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The demand for operational efficiency in wind energy implies the need of accurate measurements of mean and turbulent variables of the wind flow. High quality wind data for a given wind site allow not only to optimize the technical layout and the operation management of wind turbines, but also to reduce maintenance costs and risks of malfunctions or damages. In the past most of the wind monitoring focused on the horizontal wind components measured by conventional cup anemometers. Recently an increasing awareness of developers and operators for the importance of the complete 3D-wind vector is observed. Sonic anemometers are a perfect technology to provide reliably the 3 wind components at high sample rates with minimum maintenance costs even at sites with severe weather conditions. As the sensor head structure of a sonic anemometer provides a physical obstacle to the approaching wind flow with a corresponding bias of the measurements, the innovative Multi-Path technology has been developed to overcome the previously unavoidable limitation. Wind tunnel and field test were performed for Metek uSonic-3 Cage MP and uSonic-3 Class A MP sonic anemometers to demonstrate the achieved improvements for mean wind speed and wind direction as well as for turbulent quantities.