Inflow characterization using measurements from the SpinnerLidar: the ScanFlow experiment - DTU Orbit (07/12/2018)

We present a preliminary analysis of inflow measurements performed with a SpinnerLidar on a turbine’s nacelle and those from three grounded-based short-range continuous-wave lidars (WindScanners) during the ScanFlow experiment. After proper filtering for blade contamination and hub/nacelle shading of the beam, the SpinnerLidar measurements capture the structure of the inflow in detail. The WindScanners’ 3D measurements provide estimations of the three wind speed components without any flow assumptions. These 3D wind field measurements are used as reference to evaluate SpinnerLidar reconstructed winds. A wind reconstruction methodology for the SpinnerLidar measurements is evaluated against a numerical wind inflow simulation successfully. An intercomparison between reconstructed longitudinal velocity components from the WindScanners and the SpinnerLidar shows good agreement (no bias and high correlation) at hub height and close to zero biases for all vertical levels measured by the SpinnerLidar.

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