Lidar configurations for wind turbine control - DTU Orbit (16/08/2019)

Lidar configurations for wind turbine control

Lidar sensors have proved to be very beneficial in the wind energy industry. They can be used for yaw correction, feed-forward pitch control and load verification. However, the current lidars are expensive. One way to reduce the price is to use lidars with few measurement points. Finding the best configuration of an inexpensive lidar in terms of number of measurement points, the measurement distance and the opening angle is the subject of this study. In order to solve the problem, a lidar model is developed and used to measure wind speed in a turbulence box. The effective wind speed measured by the lidar is compared against the effective wind speed on a wind turbine rotor both theoretically and through simulations. The study provides some results to choose the best configuration of the lidar with few measurement points.

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