

Wind Doppler Lidar Analysis of a Complex Terrain in Northeastern Brazil for Wind Energy Purposes

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Abstract: : Information on the temporal and spatial variations of the wind field is crucial for a wind energy project. Currently, standard meteorological masts equipped with MEASNET calibrated wind sensors are used to measure the wind characteristics, but there are site specific wind conditions, mainly in complex terrain, that cannot be easily detected with the usual number of standard meteorological masts and their spatial distribution in a project area. The use of remote sensing technologies has increased in the wind energy projects and the Doppler wind Lidar has been used to measure important characteristics for the wind resource assessment. This work aims to study a complex terrain in northeastern Brazil, with a commercial Doppler wind Lidar, where a wind farm project is being developed. The Lidar wind measurements was first compared and validated with direct measurements from meteorological masts installed in the study area and we verified, through analysis of horizontal and vertical cross section provided by the Lidar measurements, significant differences in the distribution pattern of the wind between the daytime and nighttime periods. This study gave us background for further improvements of the wind resource assessment methodology and the use of remote sensing technology in wind energy.

References

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