Does the wind turbine wake follow the topography? A multi-lidar study in complex terrain - DTU Orbit (04/10/2019)

Does the wind turbine wake follow the topography? A multi-lidar study in complex terrain

The wake of a single wind turbine in complex terrain is analysed using measurements from lidars. A particular focus of this analysis is the wake deficit and propagation. Six scanning lidars (three short-range and three long-range WindScanners) were deployed during the Perdigão 2015 measurement campaign, which took place at a double-ridge site in Portugal. Several scanning scenarios, including triple- and dual-Doppler scans, were designed to capture the wind turbine wake of a 2MW turbine located on one of the ridges. Different wake displacements are categorized according to the time of the day. The results show a strong dependence of the vertical wake propagation on the atmospheric stability. When an atmospheric wave is observed under stable conditions, the wake follows the terrain down the ridge with a maximum inclination of −28°. During unstable conditions, the wake is advected upwards by up to 29° above the horizontal plane.

General information
Publication status: Published
Corresponding author: Menke, R.
Pages: 681-691
Publication date: 2018
Peer-reviewed: Yes

Publication information
Journal: Wind Energy Science
Volume: 3
Issue number: 2
ISSN (Print): 2366-7443
Original language: English
Electronic versions:

wes_3_681_2018.pdf
DOIs:

10.5194/wes-3-681-2018
Source: FindIt
Source ID: 2440069534
Research output: Contribution to journal › Journal article – Annual report year: 2018 › Research › peer-review