



Extreme wind event study in a wind farm area on the Isthmus of Tehuantepec using WRF high-resolution simulations.

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The Mexican state of Oaxaca with 2.400 MW of wind power capacity has 75% of all the wind farms in the country. Most of them are located in the Isthmus of Tehuantepec, where strong winds are generated as a result of large-scale meteorological conditions and local topographic characteristics. These high winds sometimes produce local extreme events such as intense lee waves or hydraulic jumps. These kinds of turbulent flows have a direct effect on the wind farms production and in the lifetime of the machines.

This study focuses on investigating hydraulic jumps using high horizontal and vertical resolution WRF (Weather Research and Forecasting) model simulations. Specifically, one day where this event has been recorded is simulated. A complete analysis of the wind flow over the hill is performed. Wind results are obtained and compared with observational data. Results show that WRF yields a good representation of the hydraulic jump during several hours of the studied day. The validation with real data is also successful, with a low error during the period.