

Abstract Submitted
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An Experimental Survey on the Interaction of Wind Turbines over Complex Terrain DIEGO SIGUENZA-ALVARADO, ALI DOOSTTALAB, Purdue University, LEONARDO P. CHAMORRO, University of Illinois at Urbana-Champaign, LUCIANO CASTILLO, Purdue University — Wind turbines sited at the top of hills benefit from the speed-up effect, relatively lower turbulence, and less significant wake influence of upstream turbines in comparison with flat terrains. In this work, we use particle image velocimetry measurements in a wind-tunnel to reveal the wake characteristics of different turbine arrays in the windward side of a 2D steep-hill. We also measure the model's power and dynamic responses, and we study its relation with the wake's turbulence statistics. The results here presented can be used for wind turbines layout optimization in complex terrains.

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