



Stuttgart, July 18, 2017

Double Hill Experiment: ZSW and SWE Measure Wind Flows for New European Wind Atlas

ZSW and Stuttgart Wind Energy (SWE), an endowed chair at the University of Stuttgart, successfully wrapped up a field campaign to collect meteorological data for the New European Wind Atlas. The two institutes' scientists teamed up for six weeks to gather information on wind speeds and aerosol distribution between two mountain ridges in Perdigão, Portugal, in a project called the Double Hill experiment.

Several European and American research institutes took part in this experiment to capture data on wind flows in complex terrain. Perdigão's situation is unusual with the prevailing wind direction running perpendicular to two parallel mountain ridges. More than 55 stationary meteorological masts dotting the mountains and valleys, 26 remote sensing systems, radiometers, radio probes, and an airplane took these measurements. The southern German wind energy research cluster [WindForS](#) dispatched scientists from its member organizations ZSW and [SWE](#) to take part in the experiment. They installed a laser-optical telemetry system (LiDAR) on one mountain ridge to record wind speed and information about aerosols distributed in the air. Data collected in May and June 2017 are now ready to be analyzed by the project's stakeholders.

The [New European Wind Atlas](#) (NEWA) is a research project aimed to compile a public database for predicting regional and local wind conditions. These data go to facilitate efforts to generate wind power in more efficient and economical ways. The Technical University of Denmark's Department of Wind Energy is coordinating the project. First published in 1989 by the Risø National Laboratory in Denmark, the European Wind Atlas was used to develop wind power projects throughout Europe in the ensuing years. Science has since made major strides, affording researchers the opportunity to update the wind atlas using more advanced meteorological measurement technology and computational models for calculating wind flows and potentials. Experiments at representative sites are underway in Denmark, Portugal, Sweden, Spain and the North Sea to take measurements such as wind direction, wind speed, temperature and humidity at sea and on land over flat, mountainous and wooded terrain. This information will serve to develop a model chain with a wide range of flow codes. Researchers will benchmark everything from local wind flows on the micro-scale codes to several days' worth of large flow patterns on the meso-scale. This model chain, in turn, is to be used for the New European Wind Atlas. Another effort is underway to develop a model chain for a site near a steep slope in complex mountainous terrain. It is part

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of [WINSENT](#) (FKZ 0324129A-F), a project to build a field-test research site pursued by WindForS.

For more reports on meteorological measurements in Perdigão, visit: <https://eos.org/project-updates/monitoring-wind-in-portugals-mountains-down-to-microscales>

https://www.nsf.gov/news/news_summ.jsp?cntn_id=241994&org=NSF&from=news

To learn more about wind power research at ZSW, visit: <https://www.zsw-bw.de/forschung/systemanalyse/themen/windenergie-forschung.html>

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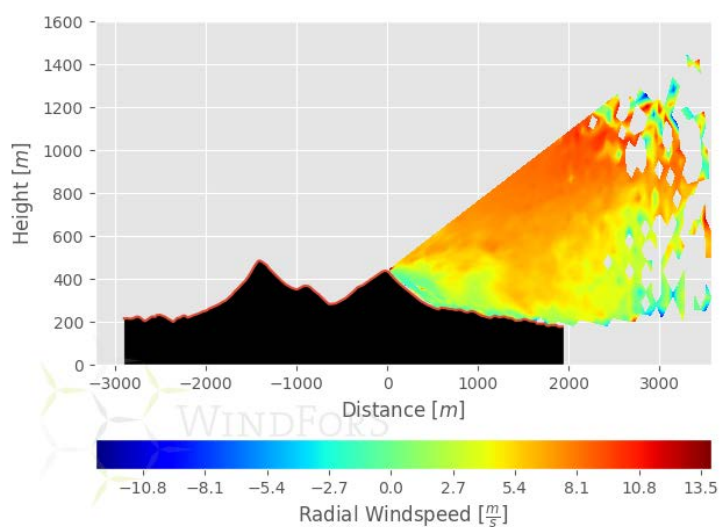


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ZSW's LiDAR scanner at the perimeter of a northeastern mountain ridge in Perdigão, Portugal, during the Double Hill experiment. Photo: ZSW



Wind speeds and wind field structures scanned by the LiDAR system. Graph: USTUTT-SWE