



Photo: Fraunhofer IWES



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## Geophysical pre-site survey in the North Sea for BSH

Fraunhofer IWES has been chosen by the Federal Maritime and Hydrographic Agency (Bundesamt für Seeschifffahrt und Hydrographie, BSH) to carry out the geophysical surveys for a third consecutive year, this time for the areas N-06-06 and N-06-07. These surveys provide the necessary information for prospective wind farm operators to evaluate individual areas and to prepare a bid for their development. Accurate knowledge of the sub-seafloor geology allows efficient design of the foundations, thus minimizing development costs. Geophysical methods, predominantly seismic methods, are a major component of detailed sub-surface models which are required to understand the complex sediment strata of the North Sea.

## 50Hertz commissions IWES with the optimization of offshore cable installation concepts

Fraunhofer IWES has been analyzing and comparing implementation plans for the cable systems to be installed in the 'Westlicher Adlergrund 2' wind farm cluster in the Baltic Sea on behalf of the transmission system operator 50Hertz. The focus here was on how various providers handle the weather risk, which has far-reaching consequences for the scheduling and budgeting of offshore

Survey operations are scheduled to take place in June/July, followed by data processing delivering vertical profiles of sedimentary structures down to a depth of several 100m below the seafloor. Relevant surfaces such as the outlines of glacial tunnel valleys may be mapped from these profiles and transferred to a sub-surface geological model. Fraunhofer IWES has already successfully employed this methodology for the surveying of multiple German wind farm areas as well as in various research projects in the North and Baltic Seas.

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wind farms. COAST, a software developed by Fraunhofer IWES, was used as a neutral basis for decision-making and further planning optimization. It is based on an hourly simulation of the construction processes using long-term weather data and enables a probabilistic risk assessment going far beyond conventional weather data statistics.

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Dear readers,

It is my pleasure to present our latest offshore newsletter to you. About ten years ago, we were one of the first players in the world to start working on floating LiDAR solutions for the offshore wind industry. Since then, our measuring system has proved its reliability and high-precision performance in several campaigns, and we have contributed to the further development of this technology with a series of research activities and our commitment to international standardization.

The exchange of lessons learned and fruitful collaboration with leading offshore wind players has enabled us to prosper in one of the most challenging environments and shift the focus from 'make it happen' to 'maximize performance and cut costs'.

In order to stay connected in these challenging times and to take part in lively exchange, I would like to invite you to the online conference 'VirtualWind II – Current challenges for offshore wind energy in the North Sea' which we are hosting together with our research partner ORE Catapult on July 8th 2020.

I hope this newsletter will provide you with many new insights and that we will have the opportunity to meet soon, at least virtually. Stay healthy!

Kind regards,  
**Dr. Julia Gottschall**

Senior Scientist,  
Division Wind Farm Development

## Successful offshore power curve measurement with floating LiDAR

Power curve measurements are of central interest to offshore wind farm operators and planners for assessing the projected yield of wind energy turbines. The LeikLine project, funded by the German Federal Ministry for Economic Affairs and Energy, compared several ways of obtaining these data. The use of floating LiDAR devices for



Photo: Thomas Viergutz, Fraunhofer IWES

### Measuring campaign with floating LiDAR at an offshore wind park

power curve measurements proved to deliver data at significantly lower costs. With regard to the reliability of the data acquisition the results were comparable to those from measuring masts and LiDAR devices mounted on the nacelle or the transition piece. The measurement campaigns were carried out at the British 'West of Duddon Sands' wind farm, whose owners, Ørsted and Iberdrola, were associated partners in the project. The project results will contribute to shape standardization activities within the framework of IEC 61400 as well as the new IEC-50-4 initiative where Fraunhofer IWES is an active participant.

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## Alpha ventus data available online

The first German offshore wind farm alpha ventus has been producing electricity and generating data for a good ten years now. These data play an important role in accompanying research projects. The German research initiative RAVE (Research at alpha ventus) is now making this internationally unique data pool, which covers an operating period of ten years, available in the form of an online database open to all research parties in industry and academia. Users are required to sign a data usage agreement. While the focus of testing was initially on technical feasibility, questions relating to technological optimization and further cost cutting are now central.

### EDITORIAL NOTE

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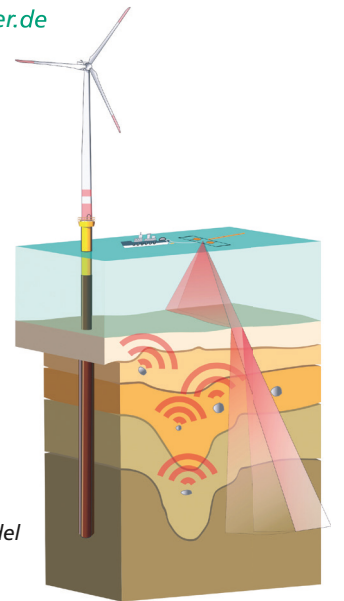
Acknowledgement:



## Boulder detection with 'Manta Ray' system approved

The first industrial application of Fraunhofer's geophysical method based on diffraction imaging with a purpose-built data acquisition system ('Manta Ray') was recently completed successfully. All proposed turbine locations of a complete wind farm in the Baltic Sea were screened reliably within several weeks. In contrast to conventional acoustic and seismic reflection procedures, the 'Manta Ray' system takes boulder detection to a new level with improved signal penetration and enhanced mapping of complex structures. The resulting boulder positions in various geological units are used for the micro-siting of monopile locations by the park operator, which significantly decreases the risk of installation failure and also cuts major remediation costs and time delays. Before the industry project, the procedure had already been tested and optimized by means of two seismic surveys with German research vessels, plus two patents have been filed for the developed method. Its development has its seeds in a joint research project with the University of Bremen and the Fraunhofer Institute for Industrial Mathematics (ITWM).

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Graphic: Fraunhofer IWES

Three-dimensional geological model showing boulder positions in the different soil layers



For more information → <http://www.rave-offshore.de>  
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