Neowind Consortium performed a successful Experimental Testing of Floating Lidar Motion Compensation

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The Neowind consortium comprising floating Lidar manufacturer EOLOS, wind energy consultancy sowento and the Stuttgart Wind Energy institute (SWE) of the University of Stuttgart, successfully completed the initial field testing phase for its collaborative Eurostars project. The initiative focused on the seamless integration of motion-compensated Vertical and Scanning Lidars into a unified structure called the Lidar Modular System.

On the test site of the University of Stuttgart and its test facilities, the consortium focused on the integration of the functionalities of Vertical and Scanning Lidars with advanced motion sensors. During the tests, the influences of different motions on the Lidar measurements were investigated by comparing the measurements to a reference unit. Figure 1 shows the test setup, where two vertical profiling ZX 300M Lidars are set up next to each other. At the same time, a prototype of an advanced scanning lidar developed in-house by the University of Stuttgart was used. One Lidar is mounted on a hexapod motion platform. With this platform, generic and prerecorded buoy motions are generated to have the Lidar measure as if it was mounted on a Lidar buoy. With the reference Lidar system, undisturbed measurements are available which allow for a clear comparison between the two systems and detailed analyses on the impact of different motion envelopes on the measurements.
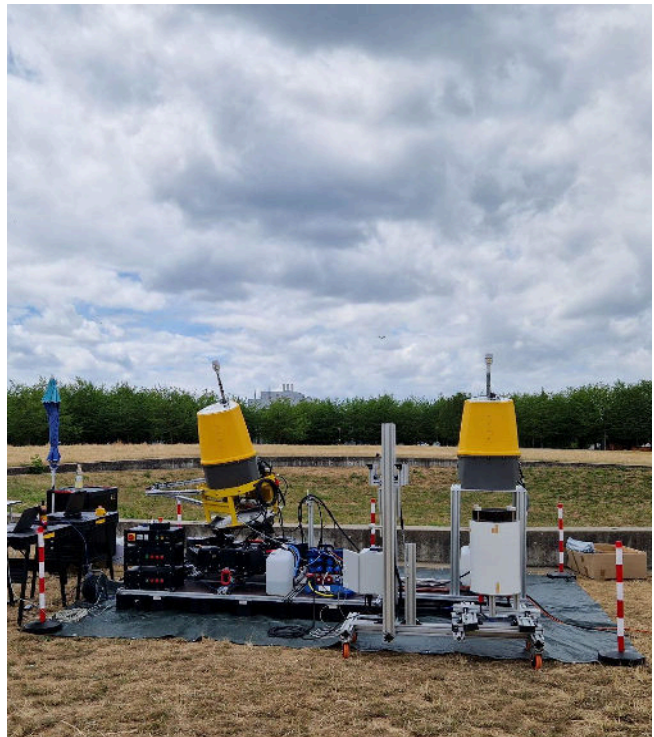

Fig 1: The test setup of the field testing. Two vertical profiling Lidars ZX 300 M are set up to measure the wind speed. One Lidar is mounted on a motion platform and performs the specified motions, the other Lidar gives reference measurements.

"The test forms another important step in the development of high resolution motion compensation for a Lidar system which we develop within the project", explains Steffen Raach,

Managing Director of sowento. The work of the Neowind project reduces uncertainties in floating Lidar measurements and opens the possibility for statistical analysis of higher resolution, like 1 minute averages as well as a good estimation of turbulence intensity. "In the near future, more and more offshore applications will demand accurate wind measurements, not just for site assessment, but also to support installation, during wind farm operation or maintenance of wind turbine assets", adds Holger Fürst, Lidar expert at University of Stuttgart.

The project has received funding through the Eurostars funding framework supported by the Bundesministerium für Bildung und Forschung.

Eurostars is the European Partnership on Innovative SMEs funding instrument that supports innovative SMEs and project partners by funding international collaborative R&D and innovation projects from 37 countries.

EOLOS specializes in providing state-of-the-art floating LiDAR buoy technology for offshore wind projects. Our innovative technology offers wind energy developers and operators a cost-effective and efficient way to collect highly accurate wind data, which is critical for project planning, construction, and operation. EOLOS floating LiDAR buoy system (FLS200) features advanced LiDAR sensors, which can measure wind speeds and directions at different heights above the sea level. The buoy is anchored in the ocean, where it continuously collects wind data 24/7, providing a reliable source of information for wind resource assessments, site characterisation, and power curve analysis.

More information can be found on www.eolossolutions.com and on LinkedIn https://www.linkedin.com/company/eolos-floating-lidar-solutions/

sowento is an engineering consultancy and technology advisor, with its main business fields in Lidar technology and floating wind as well as control applications. sowento is a spin-off from the University of Stuttgart and provides modeling, simulation and control solutions to various stakeholders of the wind energy industry. Our contribution to realize strong renewable energies is to strengthen them through innovation from research, empower the wind energy community, our team, and individuals to develop high quality results, knowledge, and smart technical solutions and to aim for the problems of today and tomorrow.

More information can be found on www.sowento.com and on LinkedIn https://www.linkedin.com/company/sowento/

Stuttgart Wind Energy (SWE) is part of the Institute of Aircraft Design at the faculty of Aerospace Engineering and Geodesy Research at the University of Stuttgart (USTUTT). The use of wind energy is actively promoted through collaborations within the university, with companies, and other research institutions. SWE is engaged in a variety of national and international research

projects, covering Lidar measurement techniques, turbine control, offshore load analysis, full scale data validation, floating wind turbine dynamics, design and standardization. SWE is also very active in national and international committees in the field of wind energy. In particular within the IEA Wind.

More information can be found on https://www.ifb.uni-stuttgart.de/en/research/windenergy/ and on LinkedIn https://www.linkedin.com/company/universitaet-stuttgart-ifb/