

Press Release

Deutsche WindGuard unlocks complex wind sites with ZX Lidars

ZX Complex Flow Solver launched with ZephyScience expertise at the core

Varel, 2021-01-07: With the introduction of a solution to allow the standalone use of wind lidar ZX 300 in complex terrain, Deutsche WindGuard has made a successful start to 2021. The new “ZX Complex Flow Solver” (ZX CFS) is the result of a joint development with the leading computational wind engineering organization ZephyScience, supported by lidar OEM ZX Lidars. Fully based on computational fluid dynamics (CFD), ZX CFS identifies, quantifies and resolves the relative differences between lidar and cup anemometer measurements witnessed in complex terrain.

“Deutsche WindGuard has been supporting lidar applications since 2004,” says Johannes Cordes, Wind and Data Analyst at Deutsche WindGuard’s Wind Resource Assessment team. “While stand-alone lidar measurements in flat terrain have already had a high acceptance in the past, we see the particular challenges of stand-alone measurements in complex terrain well addressed and appropriately treated with the ZX CFS application. The design and structure of this service provides the best available solution for bankable wind resource and energy yield assessment based on stand-alone lidar in complex terrain.”

In complex, non-benign terrain, the assumption of homogeneous flow conditions within the measurement volume introduces differences between lidar and cup anemometer. The Complex Flow Solver algorithm developed by Deutsche WindGuard is optimized for ZX Lidars’ wind field reconstruction. Incorporating results from a high-resolution CFD model, it derives a set of conversion factors. Applied to the volume-based wind data from Continuous Wave Lidar ZX 300, which samples 50 measurements points per second, these conversion factors produce single point measurements equivalent to those of a cup anemometer installed at the same location. ZX CFS even provides guidance on where to install the lidar initially to achieve the lowest possible uncertainties. Cloud computing delivers fast, transparent and accurate results.

Uncertainties associated to inhomogeneous flow conditions within the measurement volume according to IEC 61400-12-1 Ed. 2 (2017) L.4.5 can thus be reduced significantly. This widens the usability of ZX 300 wind lidar standalone deployments for wind resource assessments in complex terrain with no additional onsite met mast.

In a recent industry webinar hosted by ZX Lidars, Deutsche WindGuard and ZephyScience, nearly 1000 registrants had the opportunity to experience the launch of ZX CFS. The recording is now available here: <https://www.zxlidars.com/zx-complex-flow-solver/>

The project benefited from Horizon 2020 funding.



Photo:

Lidar measurement in complex terrain

Caption:

ZX Complex Flow Solver converts volume-based, high-resolution wind data from Continuous Wave Lidar ZX 300 into single point measurements equivalent to those of a cup anemometer.

Photo: © ZX Lidars

Deutsche WindGuard – The Wind Professionals

Deutsche WindGuard from Varel, Germany, is one of the leading independent service providers in the wind energy industry. Consulting by Deutsche WindGuard stands out due to extraordinary synergy effects across the entire service portfolio. Whether due diligence, market analysis, contract consulting or feasibility study: each of them incorporates the entire WindGuard expertise and know-how – including wind measurements, energy yield assessments and lidar calibrations. In a complex energy market, Deutsche WindGuard is committed to providing unbiased and manufacturer-independent consulting and comprehensive scientific, technical, and operational services. Deutsche WindGuard was founded in 2000. With the headquarters in Varel and subsidiaries in Germany, the United States, China and India, it employs more than 170 experienced experts.

ZX Lidars (formerly ZephIR Lidar)

ZX Lidars provides industry-leading wind lidar products, ZX 300, ZX 300M and ZX TM for wind energy and meteorological applications. These lidars deliver accurate wind measurements in both onshore and offshore applications at measurement heights/ranges across the full swept area of the blades of modern wind turbines, and beyond. With more than ten million hours of operation in the field and over 1000 deployments (and counting), ZX Lidars has pioneered the use of lidar in the wind industry. The company is proud of the many world firsts it has achieved with customers including: upwind measurements from a turbine nacelle, turbine wake studies, offshore deployments of both fixed and floating wind lidar, an industry-accepted validation process, re-financing and re-powering of a wind farm, successful demonstration of measurement accuracy in a wind tunnel and total wind project financing from a lidar without need for a met mast.

ZephyScience

ZephyScience is a French company founded in 2012. From the beginning, the company was created with an innovative mindset to revolutionise the use of computer modelling in the wind energy industry. Since then, ZephyScience has developed a range of tools and services in the wind resource assessment branch using open-source and cloud-computing technology.

Publication and redistribution free of charge; a copy exemplar to Deutsche WindGuard is kindly requested.

For more information, please visit our website: www.windguard.com.

Your contacts:

Irene Burkert

Marketing Communications Manager

Phone: +49 (0) 44 51/95 15 272

E-Mail: irene.burkert@windguard.de

Johannes Cordes

Wind and Data Analyst

Phone: +49 (0) 44 51/95 15 217

E-Mail: j.cordes@windguard.de