Webinar - Optimising design of offshore wind turbines by characterising turbulence

Measurement and modelling of offshore turbulence (POWSEIDOM & DRACCAR-NEMO JIP)

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Welcome words



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Agenda

1. Introduction and context
2. Enhancing Turbulence Fluctuation Measurements with Tailored Wind Lidar Profilers
3. Characterizing Offshore Turbulence: From Meso-Scale Models to Large Eddy Simulations
4. Advancing Wind Lidar Profilers for Improved Turbulence Measurements
5. New methods for turbulence measurements and models in offshore wind
6. Industrial Perspectives
7. Q&A Session

Introduction and Context

Neil LUXCEY

France Energies Marines

POWSEIDOM Project (2021-2024)

SECTOR NEEDS

- To improve turbines design by adjusting safety factors as closely as possible

R&D CHALLENGES

- Fine characterisation of wind and turbulence to improve turbines design

OBJECTIVES OF THE PROJECT

- To overcome the lack of wind and turbulence data from in-situ measurements in the Gulf of Lion, Mediterranean
- To propose specific recommendations for the design of offshore wind turbines in this region

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Main Results of POWSEIDOM Project

- **Dataset** for comparing lidar versus anemometer measurements
- **Processed dataset** from lidar measurements taken over a period of one year at a site representative of pilot farms in the Mediterranean: mean winds and direction, turbulence intensity, dissipation, low level jets

- **Methodology** for characterising atmospheric turbulence using the so-called variance method applied to data from lidar measurements

- **Dataset** for comparing fixed versus mobile lidar measurements
- Preliminary **motion compensation algorithm** for measuring turbulence using onboard lidar on a mobile platform

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From POWSEIDOM to DRACCAR-NEMO project

SECTOR NEEDS

To get methodologies and tools for a comprehensive assessment of turbulence at prospective offshore wind sites

LAUNCH OF A NEW PROJECT IN 2023

- Review and redefinition of turbulence metrics for the offshore wind applications
- Measurements of atmospheric turbulence
- Modelling of turbulent flows
- Reconstruction of offshore wind metrics using data-driven methods

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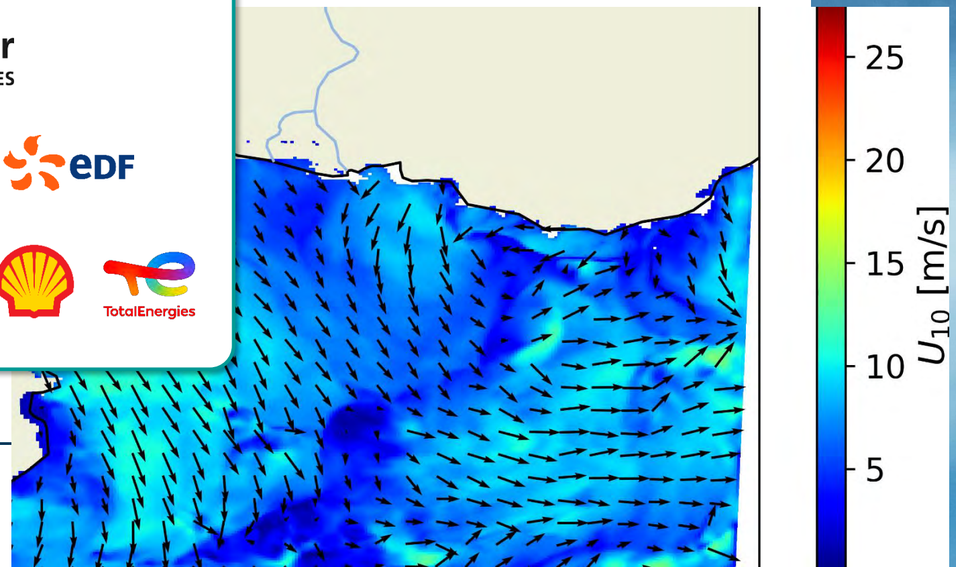

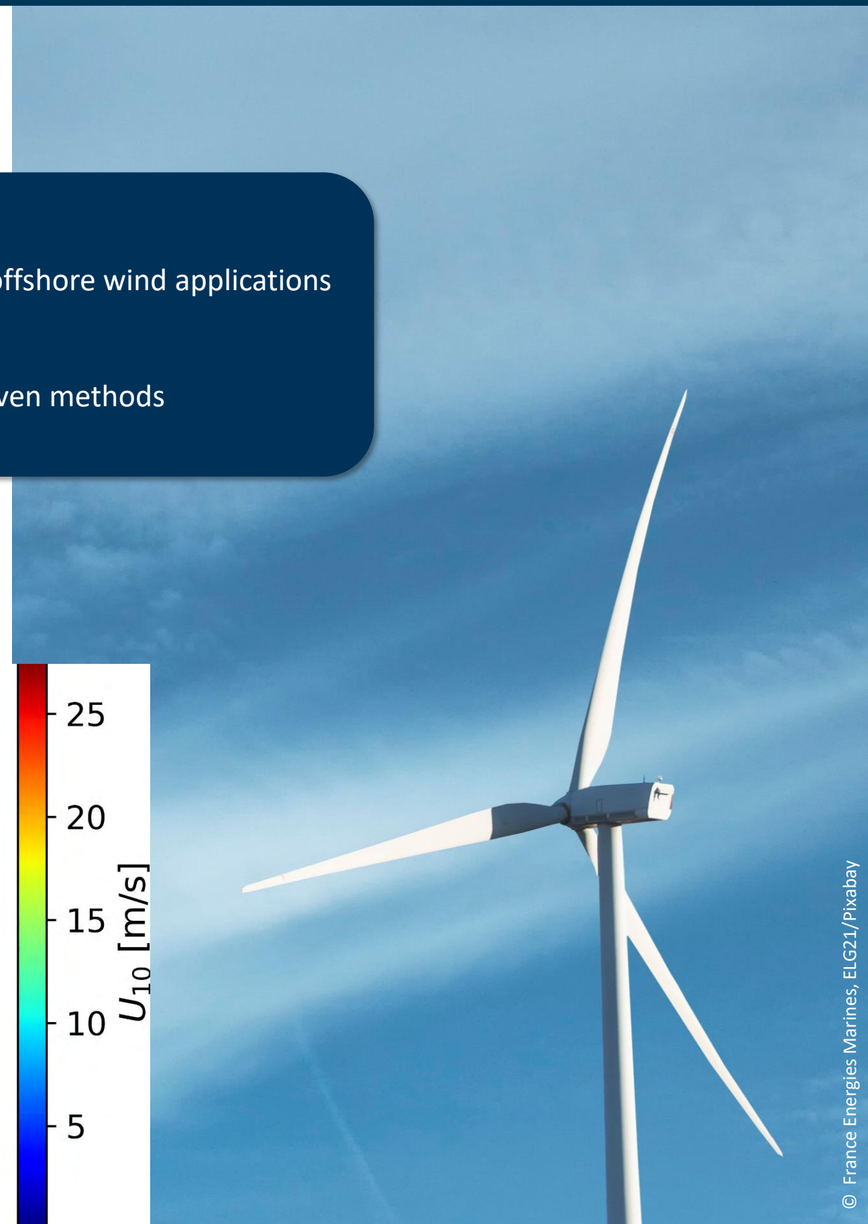

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