Investigation of the Self-aligning behaviour of the passively yawing floating wind turbine

Moustafa Abdel Maksoud(m.abdel-maksoud@tuhh.de)
Hamburg University of Technology

Abstract

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Moustafa Abdel-Maksoud, Stefan Netzband, Christian W. Schulz

Floating offshore wind turbines are a promising concept for expanding offshore wind energy. In comparison with fix-founded offshore wind turbines, the overall costs are less dependent on water depths, which leads to a variety of potential locations and markets worldwide. Furthermore, floating platforms allow for new structural designs with the potential to save material and installation costs. The presentation will focus on the capability of the advanced first order boundary element method panMARE to simulate the hydrodynamic behaviour of a self-aligning platform with a 6 MW turbine. The platform is moored on a single point and uses a turret buoy to be able to rotate freely around its anchor point. A downwind rotor and an airfoil-shaped tower induce self-aligning turning moments to passively follow changes of the wind direction. The numerical simulation method panMARE is applied to simulate the motion behaviour considering aerodynamic, hydrodynamic and mooring loads. The self-aligning capability is demonstrated under partial turbine load for steady and dynamic conditions due to waves and current.

Keywords: *Floating Wind Turbine, Self-Aligning, Motion Behaviour, Dynamic Loads, Panel Method, Boundary Element Method,*

References

[1] Stefan Netzband, Christian W. Schulz & Moustafa Abdel-Maksoud (2018): Self-aligning behaviour of a passively yawing floating offshore wind turbine, Ship Technology Research, DOI: 10.1080/09377255.2018.1555986

Biography

Promotion 1992 (Dr.-Ing) Institute of Ship and Ocean Technology, Technical University of Berlin
Feb. 1995 - Dec. 2002: Head of the department "Numerical Simulation", at Potsdam Model Basin
Jan. 2003 - July 2007 : Professor and Managing Director of Institute of Ship Technology and Transport systems, Duisburg-Essen
Since August 2007: Head of Institute for Fluid dynamics and Ship Theory, Hamburg University of Technology