

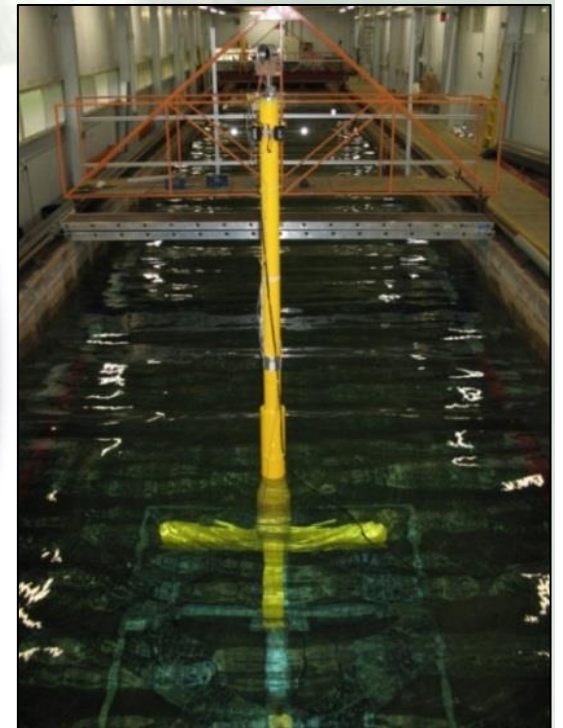
JOINT AEROSPACE/RÜZGEM SEMINARS

Experimental and Numerical Analysis of a TLP Floating Offshore Wind Turbine

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December 19, 2018, Wednesday, 13:00
Auditorium

This presentation describes an experimental and numerical investigation of the Iberdrola TLP wind turbine concept, TLPWIND, in simulated realistic wind and wave conditions. The TLP was coupled to the NREL 5MW reference turbine and was designed to operate in a water depth of 70m. The test campaign included free oscillation tests, tests in regular and irregular waves and simulated wind conditions. A Software-in-the-loop approach was adopted to account for the time-varying aerodynamic forces produced by the turbine during the physical experiments. The effect of wind was found to have a significant contribution to the overall response of the platform whilst variation in wave conditions was found to have a relatively small effect on the platform response. A comparison of results from the physical and numerical work shows that the numerical predictions from FAST compared favorably with the results obtained from the experiments in some cases, but in other cases the numerical model failed to accurately predict the platform response. The results from both studies show the benefits of such TLP structures in terms of reduced motions which are vital to reliably obtain a high power output from a floating offshore wind turbine.



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