Aeromechanical modelling and stabilization of large floating horizontal-axis wind turbines

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The size of wind turbines has increased substantially in the last decades. Moreover, industry is evaluating new profitable locations for wind turbines which require floating platforms subjected to sea movement. In this context, the structural and aerodynamic effects that were negligible before are now gaining importance. On the structural side, nonlinear deformations and couplings are being observed. On the aerodynamic side, the flows are highly unsteady and three dimensional. The current project aims to develop computational tools able to understand and quantify these new effects. Finally, these tools will be used as a computationally efficient base to generate reduced-order models to support the design of new control strategies.





This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant agreement No 765579.