



International Doctorate in Civil and Environmental Engineering

Platform optimization for Floating Wind Turbines

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Abstract
<p>The increasing demand of energy is leading to continue innovation in the renewable energy sector. Wind energy harvesting hit a milestone placing wind farm offshore, both in shallow water using fixed bottom supporting technologies and now moving to deep sea areas where floating platforms are needed. With floating technologies, construction and service costs exponentially grow, therefore, structural and mechanical optimizations have a primary role in the design of a floating wind turbine (WT).</p> <p>The doctorate project aims to find computational optimization strategies for floating wind turbines, with the intent of increasing structural performances, controlling costs. Firstly, a linearized frequency domain optimization is performed. Platform hydrodynamic is evaluated by means of the potential solver ANSYS AQWA. Turbine effects on the platform are evaluated by means of FAST, a widely used Aero-hydro-servo-elastic code. A long-term structural reliability time-domain analysis is then performed on the optimized substructure.</p>