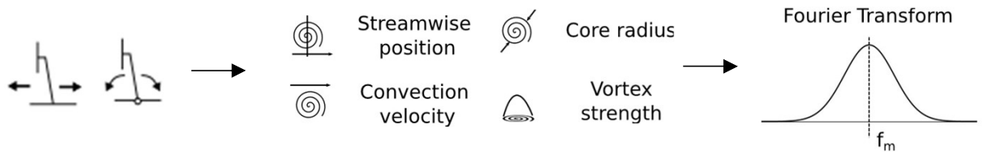
Tip vortices in the wake of a floating wind turbine

Author: Stefano Cioni
Department of Industrial Engineering
Laboratory: REASE

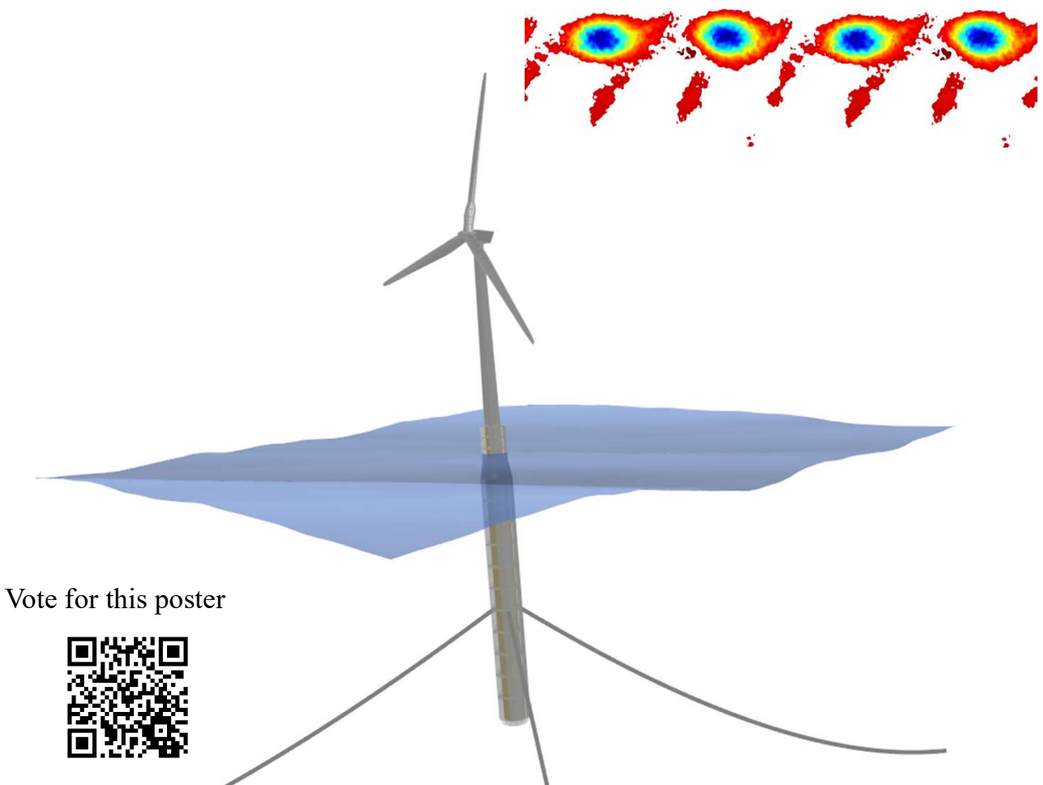
PhD program in
Industrial Engineering

How does the platform motion affect the tip vortices?

Vortex identification and analysis from experimental wind turnnel data and simulations performed within the OC6 Phase III Project. The project included 28 academic and industrial partners from 10 countries.

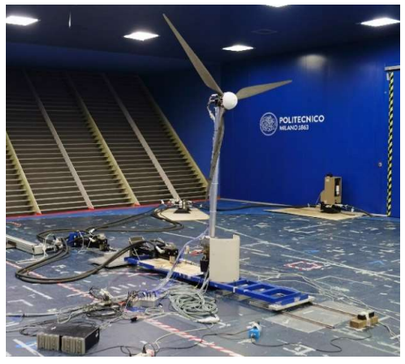


A prescribed motion of the turbine is imposed. The effect of the motion on the position, velocity, size and strength of the tip vortex is evaluated

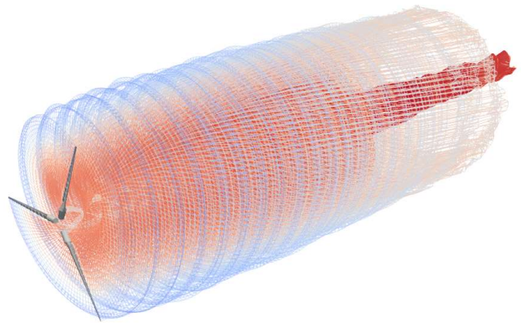


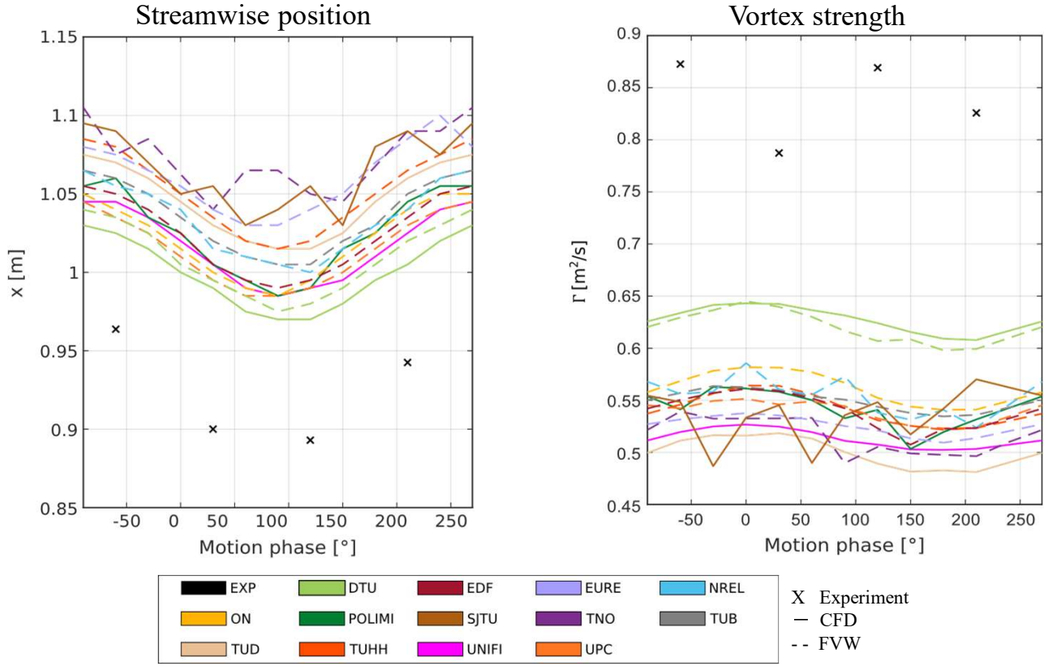
Vote for this poster

Experimental wind tunnel data



Multi-fidelity simulations





A sinusoidal motion of the platform induces oscillations in the tip vortex position and strength. The strength oscillations are in a 90° delay compared to the streamwise position.
The amplitude of these oscillations is a function of the frequency of motion.