

Numerical Study of the Effect of Inclined Columns on the Performance of Floating Offshore Wind Turbine Platform

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ABSTRACT

With the gradual development of the international wind power industry and deep-sea energy, the larger floating offshore wind turbine (FOWT) has become an attractive issue. In order to ensure the rotor normal operation, larger and stronger structure design are used which greatly increase the quality and capital of the platform. In this study, the inclined angle at 10 degrees and 20 degrees for OC4 FOWT platform are modeled. The structural properties such as light mass, ballast mass, center of mass and moment inertia are provided detailly. Based on the computational fluid dynamic technique, the hydrodynamics of these modification platform was tested compared with original platform. Under the same draft condition, it is found that the inclined angle could reduce the amplitude of pitch motion 13.57 % and 15.57 % respectively, mainly because of improvement of the moment inertia which is beneficial for platform stability.

Keywords: floating offshore wind turbine platform; inclined column; hydrodynamic response; computational fluid dynamics;

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