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Bearing Behavior of a Hybrid Monopile Foundation for Offshore Wind Turbines

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Abstract : Offshore wind energy provides a huge potential for the expansion of renewable energies to the coastal countries. High demands are required concerning the shape and type of foundations for offshore wind turbines (OWTs) to find an economically, technically and environmentally-friendly optimal solution. A promising foundation concept is the hybrid foundation system, which consists of a steel plate attached to the outer side of a hollow steel pipe pile. In this study, the bearing behavior of a large diameter foundation is analyzed using a 3-dimensional finite element (FE) model. Non-linear plastic soil behavior is considered. The results of the numerical simulations are compared to highlight the priority of the hybrid foundation to the conventional monopile foundation.

Keywords : hybrid foundation system, mechanical parameters, plastic soil behaviors, numerical simulations
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