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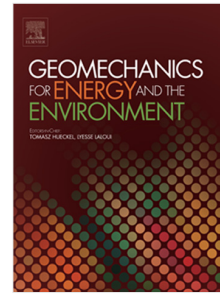
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# Dynamic analysis of umbrella suction anchor foundation embedded in seabed for offshore wind turbines

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**Abstract:** Umbrella suction anchor foundation, a novel suction foundation that applied to offshore wind turbines has been proved to be a much promising potential foundation than most of the existing foundations including Gravity base, Monopile, Tripod, Jacket and so on. The dynamic analysis of the offshore foundation is more complex, comparing with the one on the land. The work presented in this paper is to conduct a comprehensive analysis on the dynamic characteristics of the umbrella suction anchor foundation and determine its potential damage. The general finite element program ANSYS is used in the analysis. The different model vibration modes and vibration regularities of the master cylinder, the tube skirt and the anchor branches of the structure were all obtained. The structural harmonic response under loads of 0 ~ 130 Hz was simulated and discussed. Additionally, the original structure vibration response to wave loads was analyzed based on power spectrum density (PSD) method. Both transient dynamic response process and damageable parts were thoroughly studied, after two types of random loads (seismic and ice load) were applied on the structure. Through the research, the basic dynamic responses of umbrella suction anchor foundation to different external loads have been made clear. The results of the

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