

Calculation of hydrodynamics for semi-submersibles based on

NURBS(PDF)

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Title: Calculation of hydrodynamics for semi-submersibles based on NURBS

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摘要: Accurate hydrodynamic calculations for semi-submersibles are critical to support modern rapid exploration and extraction of ocean resources. In order to speed hydrodynamic calculations, lines modeling structures were separated into structural parts and then fitted to Non-uniform Rational B-spline(NURBS). In this way, the bow and stern section lines were generated. Modeling of the intersections of the parts was then done with the universal modeling tool MSC.Patran. Mesh was generated on the model in order to obtain points of intersection on the joints, and then these points were fitted to NURBS. Next, the patch representation method was adopted to generate the meshes of wetted surfaces and interior free surfaces. Velocity potentials on the surfaces were calculated separately, on basis of which the irregular frequency effect was dealt with in the calculation of hydrodynamic coefficients. Finally, the motion response of the semi-submersible was calculated, and in order to improve calculations of vertical motion, a damping term was affixed in the vertical direction. The results show that the above methods can generate fine mesh accurately representing the wetted surface of a semi-submersible and thus improve the accuracy of hydrodynamic calculations.

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备注/Memo: -

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