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Dynamic Analysis of Offshore 2-HUS/U Parallel Platform

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Abstract : For the stability and control demand of offshore small floating platform, a 2-HUS/U parallel mechanism was presented as offshore platform. Inverse kinematics was obtained by institutional constraint equation, and the dynamic model of offshore 2-HUS/U parallel platform was derived based on rigid body’s Lagrangian method. The equivalent moment of inertia, damping and driving force/torque variation of offshore 2-HUS/U parallel platform were analyzed. A numerical example shows that, for parallel platform of given motion, system’s equivalent inertia changes 1.25 times maximally. During the movement of platform, they change dramatically with the system configuration and have coupling characteristics. The maximum equivalent drive torque is 800 N. At the same time, the curve of platform’s driving force/torque is smooth and has good sine features. The control system needs to be adjusted according to kinetic equation during stability and control and it provides a basis for the optimization of control system.

Keywords : 2-HUS/U platform, dynamics, Lagrange, parallel platform
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