

Investigation of Airship Motion Sensitivity to Geometric Parameters

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Abstract : During the process of airship design, the layout and the geometric shape of the hull and fins are crucial to the motion characteristics of the airship. In this paper, we obtained the quantification motion sensitivity of the airship to geometric parameters through turning circles and horizontal/vertical zigzag maneuvers by the parameterization of airship shape and building the dynamic model using Lagrangian approach and MATLAB Simulink program. In the dynamics simulation program, the affection of geometric parameters to the mass, center of gravity, moments of inertia, product of inertia, added mass and the aerodynamic forces and moments have been considered.

Keywords : airship, Lagrangian approach, turning circles, horizontal/vertical zigzag maneuvers

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