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Hydrodynamic interaction between rigid surfaces planing on water. GHAZI BARI, KONSTANTIN MATVEEV, Washington State University — This study addresses hydrodynamic interaction of multi-surface planing hulls in the linearized, inviscid, steady flow approximation. A potential-flow-based hydrodynamic sources are distributed on the water surface to model water flow around three-dimensional hulls at finite Froude numbers. The pressure distribution on the hull surfaces are calculated as a part of the solution, and then the lift force and center of pressure are determined. For validation, numerical results are compared with an available analytical solution, experimental results, and empirical correlation equations. Parametric calculations are carried out for different hull designs in variable speed regimes, hull aspect ratios, deadrise angles and hull spacings. Results are presented for the lift coefficient, drag components, lift-drag ratio, center of pressure, and some illustrations are given for the water surface elevations. Obtained results can assist naval architects in improving design of high speed marine vehicles.

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