An Investigation into the Effects of Waterjet Tunnels on the Resistance, Trim, and Dynamic Lift of a Planing Monohull

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Abstract

This paper examines the effects of waterjet tunnels on the performance of a high-speed planning hull. The parent model of the series 62 Systematic Planing Hull Series was constructed and tested with three different configurations: bare-hull, appended hull with short waterjets tunnels, and appended hull with long waterjets tunnels. Values of resistance, CG Rise, and dynamic trim were recorded and compared between three configurations. The test results for the bare-hull correspond very well with the Series 62 test results. The effects of the waterjet tunnels on the bare-hull performance differ from one test condition to another, but in general they have higher values for resistance, trim, and CG Rise. Waterjet Tunnel B is a better performer than Waterjet Tunnel A, indicating that the opening of the waterjet inlet duct should be located further from the transom rather than closer. Finally, the model testing tank at the University of Newcastle is not the best facility for testing high-speed craft due to limited model size and carriage speed. Also, the acquisition of data for quantitative measurements is difficult because of shallow water effects that are inherent with the shallow tank depths.

References