

## **AN INVESTIGATION INTO THE RESISTANCE OF DISPLACEMENT TRIMARAN:A COMPARATIVE ANALYSIS BETWEEN EXPERIMENTAL AND CFD APPROACHES**

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### **ABSTRACT**

A displacement trimaran has several resistance components. The breakdown of these resistance components were experimentally studied by, the towing tank method. In addition, the phenomenon was also numerically studied by applying computational fluid dynamics (CFD). A typical trimaran model comprises of one main hull, which is 1.2-m long, and two symmetric side hulls, which are about 0.5-m long. The model was tested at various configurations, between Froude numbers 0.15 and 0.27, as well as at various lateral spacings (S/L) between 0.2 and 0.5. Experimentally, the model was examined with an ITS towing tank. For the CFD investigation, ANSYS-CFX was used, which is a commercial code. Each part of the trimaran hulls were tested, both experimentally and numerically. Such an individual examination, helped to elucidate on the interference phenomena between the hulls. A clear observation was noted using these methods. However, both methods helped to arrive at the same conclusion. The results demonstrated that, the wider the hull separation, the smaller the interference between the hulls. Furthermore, the wide separation (S/L=0.5) was an indication for 'no interference' between the hulls. This can be so assumed because, the overall result was comparably similar with the individual test of each hull, when interference was neglected, analyzing the obtained data comparatively with published data, which also suggests similar conclusions.

**KEYWORDS:** CFD, Interference, Resistance, Separation, Trimaran, Tank Test