

Abstract Submitted
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Flow over Barnacles—Characterization of Barnacle Geometry and Some Initial Flow Characteristics¹ JASIM SADIQUE, XIANG YANG, CHARLES MENEVEAU, Johns Hopkins University, MICHAEL SCHULTZ, United States Naval Academy, RAJAT MITTAL, Johns Hopkins University — Macrobiofouling is a serious concern for the marine industry, costing billions in preventive and control measures. Accurate modelling of flows over surfaces with such complex geometry and wide range of length scales is still a huge challenge. Such simulations are required in predicting the effects of fouling, like surface drag and also forces experienced by individual barnacles. DNS or wall resolved LES are impractical due to constraints imposed by the nature of the geometry. We aim to develop and test a computational tool for accurate simulation of such flows. The method being proposed incorporates generalized dynamic wall models along with sharp-interface Immersed Boundary Methods. The results from these simulations will help us understand the effects on surface drag caused by variations in parameters like roughness density, roughness heights, spatial heterogeneity etc. Along with this, detailed studies on a single barnacle will help us in understanding flow structures in the presence of boundary layers. In this talk we will give a brief overview of the problem and some results from our investigation on the characterization of Barnacle geometries and on the characteristics of flow over a single barnacle.

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