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**Effects of surface characteristics on hydrofoil cavitation**[1] MEGAN WILLIAMS, ELLISON KAWAKAMI, University of Minnesota, EDUARD AMROMIN, Mechmath LLC, WILLIAM HAMBLETON, ROGER ARNDT, University of Minnesota — This was an exploratory research project aimed at capitalizing on our recent research experience with unsteady partially cavitating flows. Earlier work identified the significant and unexpected effect of surface properties and water quality on the dynamics of these flows. The aim of this study was to explore the possibility of using hydrophobic surfaces to control or minimize unwanted vibration and unstable operation in the partially cavitating regime. A candidate shape, denoted as the Cav 2003 hydrofoil was selected on the basis of theoretical analysis for a given range of contact angle. We manufactured three hydrofoils of identical cross section, but different surface characteristics. Three different surfaces were studied: anodized aluminium (hydrophilic), Teflon (hydrophobic), and highly polished stainless steel (hydrophobic). Contact angle was measured with a photographic technique developed by three of the undergraduates working in the project. Studies were made in both weak and strong water. Significant surface effects were found, but were unexpected in the sense that they did not correlate with measured contact angles.

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