Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

Numerical Simulations of Bubble Dispersion over a Hydrofoil SHUANG ZHU, ANDREW OOI, The University of Melbourne, HUGH BLACKBURN, Monash University, BRENDON ANDERSON, Defence Science and Technology Organisation — The production and entrainment of bubbles in ship wakes is not completely understood despite the fact that it has many practical applications. For example, bubbles trapped in the large vortical structures in the ship wake can form clusters that are able to persist for large distances leaving a long trail of bubbles, which increases the ship's signature; an important consideration in the defence environment. The fundamental mechanisms behind the complicated bubbly flow can be understood using data from numerical simulations. The objective of the study is to investigate the accuracy of current state-of-art numerical models for simulating bubbly flows. A spectral element-Fourier code will be used to carry out direct numerical simulations (DNS) with Lagrangian particle tracking to study the interaction of the upstream bubble distribution with a hydrofoil at different angles of attack and Reynolds numbers, and the effect on the resulting downstream bubble distribution.

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Date submitted: 10 Aug 2009 Electronic form version 1.4