Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Numerical study of bubble generation in a turbulent two-phase Couette flow[1] ANDREY OVSYANNIKOV, ALI MANI, PARVIZ MOIN, Stanford University, DOKYUN KIM, Cascade Technologies Inc. — The objective of this work is to develop an understanding bubble generation mechanism due to interactions between free surfaces and turbulent boundary layers as commonly seen near ship walls. To this end, we have focused on a canonical problem that involves Couette flow between two vertical parallel walls with an air-water interface in between. We have considered flow at Reynolds number of 8000 and Froude number of 3.6, both based on half domain dimension and water properties. Our calculations resolve both Kolmogorov lengths and the Hinze scale. Additionally, a conservative VOF method coupled to a subgrid Lagrangian breakup model is used to represent the ligament breakup phenomena and their resulting bubbles and drops. We will present results from these calculations revealing bubble formation rates, bubble size distribution, and effects of bubbles on modulation of turbulence

[1]Supported by ONR

Andrey Ovsyannikov
Stanford University

Date submitted: 31 Jul 2014 Electronic form version 1.4