Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Angled wing air induction for microbubble drag reduction[1]
YUICHI MURAI, Hokkaido University, ICHIRO KUMAGAI, YUJI TASAKA, YOSHIAKI TAKAHASHI, RAND Engineering Co. Ltd — Interfacial dynamics above an angled wing which is submerged into shallow water is investigated. Our experimental study aims at designing a high-performance bubble generator for microbubble drag reduction in marine vehicles. The performance being parameterized by the size and the amount of bubbles is determined by flow physics which is represented by triple interference among the air layer, the water flow, and the solid wing. The wing gives rapid deformation of the interface as well as disturbance before downstream high-speed wave-breaking and further later bubble fragmentation with help of Kelvin-Helmholtz instability. We have already demonstrated several practical installation of the device onto commercial ships from small to large scale. The presentation deals with the visualization of the wing-above behavior of gas-liquid interface that triggers the generation of fine bubbles in its downstream layer.

[1]NEDO and JSPS

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Date submitted: 05 Aug 2011 Electronic form version 1.4