

Abstract Submitted
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Near Wall Bubble Transport in a Forced Turbulent Boundary Layer DAVID JEON, MORY GHARIB, Caltech, GALCIT TEAM — Transport of bubbles in turbulent boundary layers remains an area of active research. One of the areas of recent interest is the use of bubbles in skin friction drag reduction. However, for drag reduction to be effective, it seems that bubbles need to be kept in the near wall region, where wall shear stress derives from. Simulating the conditions meaningful to full scale vessels is very difficult in the laboratory due to scaling issues. Towards that end, we have used the idea of forced turbulence to simulate the near wall region. This allows us to inject bubbles into what is effectively the sub-layer, letting us explore bubble transport very close to the wall. We used the hydrogen wire technique to generate bubbles through electrolysis of water. The generating wire was placed at various heights above the wall to measure how transport is affected by injection location. Results indicate that injection at the wall may not be optimal with regards to keeping the bubbles near the wall. The authors would like to thank the Office of Naval Research for their support under Grant No. N00014-00-1-0110.

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