Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

**Laboratory study of the wind structure over surface waves** MARC BUCKLEY, FABRICE VERON, University of Delaware — Airflow dynamics above waves strongly influence exchanges of heat, momentum and mass between the Ocean and the Atmosphere. We present experimental results on the detailed structure of the airflow above waves. The experiments took place at University of Delaware's large (42m long, 1m wide, and 1.25m high) wind-wave facility where a variety of winds, wave ages and steepnesses were generated by a wind-tunnel and a mechanical wave generator. Airflow properties within and above the viscous sublayer were obtained using PIV, while wave profiles and spectra were measured by laser-induced fluorescence. We intermittently observe a separation of the viscous sublayer past the wave crest in certain wind-wave conditions. Despite the intermittent aspect of this sheltering effect, when averaged over all wave phases, our results suggest that there is a substantial along-wave variability of the surface viscous tangential stress, which in turn may affect wave growth and the air-water momentum balance.

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Date submitted: 10 Aug 2011 Electronic form version 1.4