

Abstract Submitted
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Airflow separation events above surface waves FABRICE VERON, MARC BUCKLEY, Univ 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 details of the airflow above surface gravity waves for a several wind speeds, wave ages and slopes. The bulk of the results presented were obtained from a series of laboratory experiments that took place at the University of Delaware's Air-sea interaction facility. Airflow properties within and above the viscous sublayer were obtained using PIV, and wave profiles and spectra were measured by laser-induced fluorescence. We observe direct evidence of intermittent separation of the viscous sublayer past the crest of the wind waves. Despite the intermittent aspect of this phenomenon, ensemble averages of the wave phase-locked velocity products suggests the airflow separation yield significant flux of vorticity away from the surface thereby generating intense mixing and momentum transport within the airflow. These events, in turn, may affect wave growth and the air-water momentum balance. Our results hold for wind speeds that would normally be considered low to moderate. Implications for models of air-sea momentum flux will be discussed.

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