



Winds very near the Surface of Waves

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The concept of constant-flux layer is usually employed for extrapolations of wind measurements done near the ocean surface. The surface waves, however, modify the balance of turbulent stresses very near the surface, and therefore such extrapolations can introduce significant biases. This is particularly essential for buoy measurements in extreme conditions, when the anemometer mast is within the Wave Boundary Layer (WBL) or even below the wave crests. In this paper, field data and a WBL model are used to investigate such biases. It is shown that near the surface the turbulent fluxes are less than those obtained by extrapolation using the logarithmic-layer assumption, and the mean wind speeds are correspondingly larger. Such results have essential implications for air-sea interaction research, wave modelling and measurements.