



## **A laboratory investigation of wave effects on upper ocean turbulence**

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A systematic laboratory investigation of wind and wave driven surface turbulence was undertaken at the SUSTAIN hurricane simulation wind-wave tunnel (18 m long, 6 m wide, 2 meter high, located at RSMAS, University of Miami). The steady state of near-surface turbulence was investigated, while forced by combinations of wind and mechanically generated waves. The study particularly aimed to isolate the effect of varying mechanically generated wave steepness on turbulence in otherwise constant wind conditions. Surface turbulence was measured and visualized by means of passive infrared imaging, active thermal marking velocimetry, laser induced fluorescence, and particle image velocimetry. These techniques were able to visualize and quantify a near-surface turbulence field richly populated with counter-rotating vortices elongated in wind direction and ranging in diameter from  $\sim 1$  cm to  $\sim 0.5$  m. The resulting dataset is designed to become an empirical test-bed suitable for evaluation of Langmuir turbulence Vortex force, as well as other upper-ocean wave-turbulence production and interaction theories.