1141-65-214 **Dong Wang*** (dongwang@udel.edu), Robinson Hall 210, University of Delaware, NEWARK, DE 19711, and **Tobias Kukulka**, **Brandon G. Reichl**, **Tetsu Hara**, **Isaac Ginis** and **Peter P. Sullivan**. *Langmuir turbulence in the tropical cyclone conditions.*

Wind-driven Eulerian currents interact with surface waves, generating Langmuir turbulence (LT) through the Craik-Leibovich vortex force. LT plays an important role in turbulent momentum transport and has been observed even in the tropical cyclone (TC) conditions that characterize complex wind wave forcing. Based on a large eddy simulation approach, this study investigates the response of LT to TC. The Stokes drift vector that drives LT is determined from spectral wave simulations. LT features strong downwelling and upwelling velocities whose spatial autocorrelation illustrates elongated structure with a principal axis that is used to specify LT's direction. In spite of misaligned wind and wave propagation directions under TCs, the direction of LT is found to be aligned with the wind mostly. This is because Lagrangian shear, that is the sum of Eulerian shear and Stokes drift shear, determines LT's direction and is aligned with the wind. In the presence of LT, the upper OSBL is well-mixed with weak Eulerian shear and, thereby, Lagrangian shear is dictated by Stokes drift shear that is dominated by wind-aligned short waves. Conditional averages reveal that larger scale coherent structures due to LT occupy the upper one-third of the OSBL and efficiently transport heat and momentum. (Received July 30, 2018)