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# AI34E-1682: Wind turbulence over surface waves in a strongly forced condition – LES and observation

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Wednesday, February 14, 2018

04:00 PM - 06:00 PM

📍 Oregon Convention Center - Poster Hall

The impact of sea state on air-sea momentum flux, or drag coefficient, is a poorly understood component of wind-wave interactions, particularly in high wind conditions. Wind stress and mean wind profile over the ocean are modulated by transient turbulent events, the occurrence and intensity of which are dependent on surface wave conditions. The characteristics of boundary layer turbulence over waves can delineate the effects of wave age, wave slope, and other wave parameters on wind stress and mean wind profile. A large-eddy simulation (LES) for wind over a sinusoidal wave train has been employed to reproduce laboratory observations of airflow over waves in strongly forced conditions. The LES and observation both use a wave-following coordinate system with a decomposition of wind velocity into wave mean, wave fluctuation, and turbulent fluctuation components. The LES results of the mean wind profile as well as the mean and spatial structure of wave-induced and turbulent stress components agree well with the observations. In particular, both model and observation show enhanced turbulence at the height of the wave crest, signifying the occurrence of intermittent airflow separation events.

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## Plain Language Summary

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