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CHANGES TO THE SURFACE WAVE BOUNDARY LAYER IN THE PRESENCE OF PARTIAL ICE COVER.

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In the open ocean, surface waves break and form whitecaps in response to a given wind stress. The wave breaking dissipates energy in the form of turbulence, such that equilibrium balance occurs with the wind forcing. Recent field observations of waves, winds, and turbulence in the presence of partial sea ice cover suggest that this equilibrium balance is significantly altered. The short waves are damped, wave steepness is reduced, and whitecaps are suppressed. Given the same wind forcing, the results imply a rapid repartitioning of the wind stress. The portion of the wind stress acting on the ice is likely much higher than a linear partitioning based on ice cover would suggest. Implications for wave evolution in partial ice cover and for ice mechanics are discussed.