

Abstract Submitted
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Non-equilibrium model of spray-stratified atmospheric boundary layer under high wind conditions¹ YEVGENII RASTIGEJEV, North Carolina A&T State University, SERGEY SUSLOV, Swinburne University of Technology, Australia — Tropical cyclone is a complex meteorological phenomenon which dynamics is defined by a wide variety of factors including exchange of momentum, heat and moisture between the atmosphere and the ocean. Ocean spray plays an important role in this air-sea interaction. Here we developed a two-temperature non-equilibrium variable density (non-Bousinessq) turbulence closure model to describe the ocean spray-stratified hurricane boundary layer structure and dynamics. The model consistently describes a two-way coupling between mechanical and thermodynamic influences of the ocean spray. The obtained results confirm that the impact of non-equilibrium effects is significant over the complete range of possible spray concentration values, therefore has to be included into a consistent parameterization of moisture, heat and momentum transfer process over the ocean under high wind condition of a hurricane.

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