

Abstract Submitted
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The Sensitivity of Spume Droplet Trajectories to Initial Conditions¹ ROBERT JAQUETTE, FABRICE VERON, University of Delaware — Marine aerosols (sea spray) facilitates the exchange of momentum, heat, and moisture across the air sea interface. Quantifying the total exchange between spray and the surrounding atmosphere remains critical to our further understanding of topics such as climate change and tropical cyclone intensification. However, estimating the total spray-induced air-sea fluxes from inertial droplets remains difficult due to a lack of observations associated with the generation (i.e. fluxes) of drops at the air-sea interface. In this work, we utilize a Lagrangian stochastic model based upon coupled dynamic and thermodynamic equations, to generate sets of single drop trajectories, as well as radii, temperatures time series. In this talk, we present results on drop lifetimes and vertical distributions under various initial atmospheric/wave conditions. The results suggest a strong sensitivity to initial conditions for droplet ejection, particularly for spume droplets, which are subsequently exposed to different regions within the wave boundary layer thereby influencing the ultimate thermodynamic drop-atmosphere transfers. These results suggest that experimental work is needed to improve our understanding of the mechanism of spume generation.

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