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Size Distributions and Dynamics of Sea Spray Droplets Produced by Breaking Waves in Various Wind Speeds[1] SCHUYLER MOSS, University of North Carolina - Chapel Hill, ROBERT JAQUETTE, FABRICE VERON, University of Delaware — Sea spray is thought to be an essential component of the total air-sea fluxes of momentum, heat, and moisture. While exchange rates for momentum, heat and moisture for suspended water droplets interacting with their ambient surroundings are generally well understood, spray-induced air-sea fluxes particularly from large spume droplets remain hindered by uncertainty associated with the generation (i.e. fluxes) of drops at the air-sea interface. Size and velocity distributions of sea spray droplets generated by mechanical breaking waves in various wind speeds were captured utilizing a multicolored double exposure particle tracking velocimetry experimental setup. Repeated trials at incremental distances downstream from the breaking location provided the size and velocity distributions necessary for estimating droplet surface fluxes. Results from these trials indicate a correlation between longer droplet lifetimes, and increased air velocity. Possible explanations for this relationship include increased ejection velocities or extended suspension periods induced by the airflow. However, a complete understanding of spume droplet ejection velocities remains unresolved and are thus an integral component for further insight into droplet dynamics and exchange fluxes.

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