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A kinetic approach to estimate air-sea exchanges driven by sea spray in high winds. FABRICE VERON, University of Delaware, LUC MIEUSSENS, University of Bordeaux, France — Sea-spray is known to be a fundamental component of air-sea heat flux in high wind speed conditions where water drops are frequently ejected from the sea surface because of breaking waves and breaking related phenomena such as bubble entrainment and whitecaps. Once ejected from the ocean surface, these drops are transported and dispersed in the Atmospheric Boundary Layer (ABL) where they interact and exchange momentum, heat, and moisture with the ambient atmosphere. However, understanding of these spray fluxes pathways, and our ability to model them remains limited. In this work, we borrow the framework from established kinetic gas theory, and apply these mathematical tools to model the transport of spray droplets and the exchanges of heat, momentum, and moisture between the drops and the atmosphere. Within this framework, one of the most vexing component of this spray flux problem, i.e. the feedback from the drops on the atmosphere, is relatively straightforward to account for. This work is largely exploratory and in the early stages of development. We will present an overview of the approach as well as preliminary results.

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