Abstract Submitted
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**Impact of interfacial instability on the multiphase turbulence statistics in a two-phase mixing layer**[1] YUE LING, Baylor University, DANIEL FUSTER, Institut d'Alembert, Sorbonne Universites-UPMC, CNRS, GRETAR TRYGGVASON, John Hopkins University , STEPHANE ZALESKI, Institut d'Alembert, Sorbonne Universites-UPMC, CNRS — A gas-liquid mixing layer formed between parallel gas and liquid streams is an important fundamental problem in turbulent multiphase flows. The velocity difference between the gas and liquid streams triggers a Kelvin-Helmholtz instability at the gas-liquid interface, which develops into an interfacial wave moving downstream. The development of the interfacial wave perturbs the gas stream vorticity layer and the latter transitions from laminar to turbulent flows. The interfacial instability can be convective or absolute depending on the input parameters. In the present study we investigate a case in the absolute instability regime. As a result, a dominant frequency arises in the gas-liquid mixing layer, which is well predicted by viscous instability theory. As the interfacial wave plays a critical role in the transition to turbulence and their development, the temporal evolution of turbulent fluctuations is found to follow a similar frequency. The turbulence statistics, including Reynolds stresses and turbulent kinetic energy (TKE) budget are computed. High mesh resolution is required to yield converged turbulent dissipation. Kolmogorov and Hinze scales are calculated based on the measured dissipation.

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