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Effects of droplet size on droplet evaporation rate in isotropic turbulence ANTONINO FERRANTE, MICHAEL DODD, University of Washington — Our objective is to determine the effects of varying the ratio of the droplet diameter to the Kolmogorov lengthscale (D/η) on droplet evaporation rate in forced isotropic turbulence. We have performed DNS of a single droplet in forced isotropic turbulence using the volume-of-fluid method to fully resolve the process of momentum, heat, and mass transfer between the liquid droplet and the gas. The effect of droplet size on the droplet vaporization rate is investigated by increasing D/η from 0.5 to 10 by increasing the Taylor-scale Reynolds number Re_λ from 10 to 75. We will present the droplet evaporation rate as a function of D/η and compare our results with available experimental data. The DNS results show that increasing D/η increases the droplet evaporation rate, which is in agreement with experiments. The physical mechanisms of such behavior will be explained by analyzing the DNS results.

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