DNS of fully-resolved droplet-laden decaying isotropic turbulence[1] A. FERRANTE, M. DODD, University of Washington, Seattle — We investigated the effects of finite-size droplets on decaying isotropic turbulence by performing direct numerical simulation (DNS). We performed DNS using our new pressure-correction/volume-of-fluid method that is mass-conservative and second-order accurate. The simulations were performed at $\mathrm{Re}_{\lambda 0} = 75$ on a 1024^3 grid such to resolve each droplet with 32 grid points per diameter. We fully resolve all the relevant scales of turbulence around thousands of freely-moving droplets of Taylor length-scale size as well as the fluid motion inside the droplets. We will discuss the effects of the droplets on the temporal development of turbulence kinetic energy and its dissipation rate. Also, we will present the effects on turbulence of the droplet Weber number and of the density ratio between the droplet and the surrounding fluid.

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