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Numerical Forcing of Dense Particle-Laden HIT Flows CAIREN MIRANDA, JOHN PALMORE, Virginia Tech — Particle-laden flows are common to many scientific and engineering applications. One particular area of interest is high mass loading of particles in turbulent flows, which is commonly found in sprays and fluidized beds, among other applications. As a step in that direction, this paper introduces filtered linear forcing (FLF) as a tool for studying dense, low Mach number, particle-laden homogeneous isotropic turbulence (HIT) flows, and the strategy is compared to ordinary linear forcing (OLF). OLF is an effective way to generate isotropic turbulence in a periodic domain, and FLF algorithm applies a low-pass filter to the source term in the OLF algorithm in order to attain flows at higher Reynolds Number. An in-house finite volume code is used to implement an Eulerian framework to solve the gas phase transport equations, and Lagrangian equations are used to solve the liquid phase. In this study, particles with Stokes Number $St \geq 1$ in HIT flow are analyzed, as their behavior is different from smaller St particles, wherein $St \geq 1$ particles have inertia and non-trivial slip compared to the gas phase. After achieving statistical stationarity, the particle clustering is compared between the FLF and OLF techniques, and the numerical stability is tested and compared as well.

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