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Simulations of decaying turbulence laden with particles: how are statistics affected by two-way coupling numerical scheme?[1] JEREMY HORWITZ, ALI MANI, Stanford University — This work builds on our recent analyses of two-way coupled particle-fluid systems under laminar conditions, in which we demonstrated that standard interpolation schemes in conjunction with the point-particle approximation can lead to significant underprediction of momentum exchange between the two phases. A simple interpolation correction scheme has been proposed which accounts for the difference between the disturbed and undisturbed fluid velocity at the location of each particle. The objective of this work is to demonstrate how different interpolation and projection schemes affect flow and/or particle statistics in a mean-stationary turbulent environment. We use direct numerical simulations of the Navier-Stokes equations to study decaying homogeneous isotropic turbulence laden with particles with different particle Stokes numbers, mass-loadings, and particle diameters to grid size.

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