Pairwise Interaction Extended Point-Particle (PIEP) model for multiphase jets and sedimenting particles.[1] KAI LIU, S. BALACHANDAR, Univ of Florida - Gainesville — We perform a series of Euler-Lagrange direct numerical simulations (DNS) for multiphase jets and sedimenting particles. The forces the flow exerts on the particles in these two-way coupled simulations are computed using the Basset-Bousinesq-Oseen (BBO) equations. These forces do not explicitly account for particle-particle interactions, even though such pairwise interactions induced by the perturbations from neighboring particles may be important especially when the particle volume fraction is high. Such effects have been largely unaddressed in the literature. Here, we implement the Pairwise Interaction Extended Point-Particle (PIEP) model to simulate the effect of neighboring particle pairs. A simple collision model is also applied to avoid unphysical overlapping of solid spherical particles. The simulation results indicate that the PIEP model provides a more elaborative and complicated movement of the dispersed phase (droplets and particles).

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