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Dynamic subgrid-scale modeling for LES of particle-laden turbulent flows[1] MAXIME BASSENNE, GEORGE ILHWAN PARK, JAVIER URZAY, PARVIZ MOIN, Center for Turbulence Research, Stanford University — A new dynamic model is proposed for large-eddy simulations of small inertial particles in turbulent flows. The model is simple, involves no significant computational overhead, and is flexible enough to be deployed in any type of flow solvers and grids, including unstructured setups. The approach does not require any tunable parameters and is based on the use of elliptic differential filters. Particle laden isotropic turbulence and turbulent channel flow are considered. Improved agreement with direct numerical simulation results are observed in the dispersed-phase statistics. The comparisons include analyses of particle acceleration, local carrier-phase velocity, turbophoresis, and preferential-concentration metrics.

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