Eulerian modelling of dilute solid suspensions of heavy particles

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Solid suspensions in turbulent flows form a complex dynamical system of great interest for both fundamental and industrial research. The main technique used to model such systems is a Lagrangian description of the particles. In the past years, several attempts have been made toward an Eulerian description of such a solid dilute phase. Most of them however have a limited range of Stokes number of validity.
Therefore we present a new formulation inspired from statistical mechanics and lattice hydrodynamics.
We will first briefly present the work already done in this field, then our resolved dynamics. We will then present some theoretical arguments for the convergence of the numerical method. Finally, some qualitative results as well as insights of quantitative measurements to characterize the quality of the representation as well as the convergence of the numerical scheme.

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