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Eulerian-Eulerian CFD Model for the Sedimentation of Spherical Particles in Suspension with High Particle Concentrations

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A computational study of the process of sedimentation of spherical particles in suspensions with high particle concentrations has been performed with the two-fluid Eulerian approach. The solid stress induction in the dispersed phase was modelled through modification of the suspension viscosity. Convectonal flow patterns were found and studied during the simulations. The presence of these patterns, which are also observed experimentally, makes the sedimentation process dependant on the rheological behaviour of the suspension. The results of the simulation were validated with experimental results. The present paper shows that Eulerian-Eulerian simulations can account for some of the detailed processes taking place in a settling suspension of particles.

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