

Abstract Submitted
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Fully resolved simulations of particle sedimentation¹ ADAM SIERAKOWSKI, YAYUN WANG, ANDREA PROSPERETTI, Johns Hopkins University — Progress in computational capabilities – and specifically in the realm of massively parallel architectures – render possible the simulation of fully resolved fluid-particle systems. This development will drastically improve physical understanding and modelling of these systems when the particle size is not negligible and their concentration appreciable. Using a newly developed GPU-centric implementation of the Physalis method for the solution of the incompressible Navier-Stokes equations in the presence of finite-sized spheres, we carry out fully resolved simulations of more than one thousand sedimenting spheres. We discuss the results of these simulations focusing on statistical aspects such as particle velocity fluctuations, particle pair distribution function, microstructure, and others.

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