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Transport and Sedimentation of Suspended Particles in Fracture Channels TAK SHING LO, JOEL KOPLIK, Levich Institute and Department of Physics, City College of the City University of New York — Particulate suspensions are ubiquitous in nature and in many artificial situations, and their transport and deposition dynamics are of importance in many chemical, petroleum and environmental processes. While most of the studies in particle transport in confined geometry were done with smooth surfaces in the past, realistic geological fractures usually have irregular rough surfaces that have self-affine structures. We consider the combined effects of sedimentation and inertial transport of particles suspended in a Newtonian fluid in a pressure-driven flow in channels with self-affine surfaces, which is especially relevant to clogging phenomena where sediments may block continuous fluid flows in channels that may occur in geological or industrial processes. We perform a systematic study using the lattice Boltzmann method, which is flexible and particularly suitable for handling irregular geometry. Our results cover a board range in Reynolds and buoyancy numbers, and in particle concentrations.

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