Particle-laden flow in a spiral separator SUNGYON LEE, Dept. of Mathematics and Applied Mathematics Laboratory, University of California, Los Angeles, CA 90095, YVONNE STOKES, School of Mathematical Sciences, The University of Adelaide, South Australia, 5005, Australia, ANDREA BERTOZZI, Dept. of Mathematics and Applied Mathematics Laboratory, University of California, Los Angeles, CA 90095 — Spiral concentrators are used in the mining industry to separate particles of different size or density. The existing modeling literature considers the flow as a background fluid carrying non-neutrally buoyant particles. However recent work on modeling of slurries on inclines shows that at relatively modest volume fractions of particles, the presence of the particles affects the flow and, moreover, interparticle interactions such as hindered settling and shear-induced migration can quantitatively explain the dynamics of the separation of particle mixtures under gravity. We incorporate this physics into a model for particle segregation in a spiral concentrator.

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