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Instabilities and global order in concentrated suspensions of spherical microswimmers ARTHUR EVANS, UCLA, TAKUJI ISHIKAWA, TAKAMI YAMAGUCHI, Tohoku University, ERIC LAUGA, UCSD — We use numerical simulations to probe the dynamics of concentrated suspensions of spherical microswimmers interacting hydrodynamically. Previous work in the dilute limit predicted instabilities of aligned suspensions for both pusher and puller swimmers, which we confirm computationally. Unlike previous work, we show that isotropic suspensions of spherical swimmers are also always unstable. Both types of initial conditions develop long-time polar order, of a nature which depends on the hydrodynamic signature of the swimmer but very weakly on the volume fraction up to very high volume fractions.

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