Spontaneous symmetry breaking of an active magnetic fluid AMIR NOURHANI[1], University of Akron, DAVID SAINTILLAN[2], University of California San Diego — We develop a continuum kinetic model for the dynamics of self-propelled micromagnets in a Newtonian fluid. Starting from a uniform random configuration, long-range interactions between magnetic dipoles lead to spontaneous symmetry breaking and unidirectional flow of the active suspension. By exploring the parameter space we investigate the order-to-disorder transition and obtain a phase diagram as a function of magnetic flux, number density, and diffusivity.

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