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Concentration-dependent Onset of Natural Convection in Magnetic Fluids YI LIU, JUN HUANG, ZHENYU ZHOU, WEILI LUO, University of Central Florida, CONDENSED MATTER MAGNETISM TEAM — The convective heat transfer in magnetic fluids was studied as a function of particle concentrations in a quasi-one dimensional cell with externally applied temperature difference across the sample. The local temperature distribution measured by eight thermal sensors indicates that the onset of the convection depends monotonically on the concentration of particles, suggesting the resistance to the fluid motion from the particles. From the time-dependent temperature profile we obtained the speed of the flow front to be in the order of 10^{-4} m/s. This work renders the possibility of studying the effect of applied fields to the convective flow.

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