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Field-induced motion of ferrofluid droplets through immiscible viscous media[1] S. AFKHAMI, Y. RENARDY, M. RENARDY, J. RIFFLE, Virginia Tech, T. ST PIERRE, University of Western Australia — The motion of a hydrophobic ferrofluid droplet placed in a viscous medium and driven by an externally applied magnetic field is investigated numerically in an axisymmetric geometry. Initially, the drop is spherical and placed at a distance away from the magnet. A numerical algorithm is derived to model the interface between a magnetized fluid and a non-magnetic fluid via a volume-of-fluid framework. Results for a range of magnetic Laplace number and magnetic Bond number are given. The time taken by a droplet to travel through a viscous medium and the deformations in the drop are investigated and compared with experimental studies.

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