Simulation of Magnetic Behaviour of Ferrofluid

We present a Femlab modeling study of an integrated, magnetic behaviour of ferrofluid. Ferrofluids are liquids that become strongly polarised in the presence of a magnetic field. Ferrofluids are composed of magnetic particles typically of order 10 nm suspended in a carrier liquid such as an organic solvent or water. The particles are coated with surfactants to prevent agglomeration and facilitate dispersion in the liquid. Ferrofluids are poised for adoption in many new applications. Femlab has also enabled the study of these nano materials in two dimensions, coupling electromagnetic fields into the full magnetic relaxation relations implemented in PDE mode and full Navier-Stokes equations describing the flow dynamics. The results from the two-dimensional Femlab simulations are in excellent agreement with experimentally obtained data.

Keywords: Ferrofluids - magnetic fluids - Femlab simulation

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