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Shear flow induced magnetic field in suspensions of magnetic nanoplatelets

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Ferrofluids containing anisotropic magnetic particles exhibit complex coupling between hydrodynamic flow and magnetic response. In this work, we investigate suspensions of barium hexaferrite (BaHF) nanoplatelets, which possess strong magnetic dipole moments combined with anisotropic shape. We examine their behaviour under shear flow, where particle alignment is induced. Using a zero-field magnetometer, we measure the magnetic field arising from collective dipole ordering. We find that shear-induced alignment leads to a measurable macroscopic magnetic signal, consistent with the emergence of net magnetization in the flowing suspension.

Type:

Poster