THE SORET EFFECT IN THIN FILMS OF MAGNETIC FLUIDS

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9.7 cm

The Forced Rayleigh scattering method (the interference of two intensive laser beams in a thin film of magnetic fluid) was used to create the periodical structure of needle–like clusters of magnetic particles. This creation is caused by thermodiffusion effect known as the Soret effect. The obtained structures were indicated as a self diffraction effect of the primary laser beams. Experiments were made in water, kerosene and mineral oil–based magnetic fluids. Relaxation phenomena (destruction of periodical array of clusters) after switching off the laser beams were observed too. The experimental results were discussed in terms of distribution function of the relaxation times. The latter was related to real parameters of magnetic fluids, i.e. viscosity of the liquid carrier and the particle size distribution function.

13.4 cm

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