

# Variation of magnetic fluid deformation related to nanoparticle concentration in steady electric field

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Today, it is important to know the behaviour of magnetic fluids applied in the power electrical machines, when exposed to an electric field. The structure of such magnetic fluids is easily controllable by external magnetic fields. However, less attention has been paid to structural phenomena in magnetic fluids induced by electric fields. The core of this paper is dedicated to the experimental observation of a magnetic fluid droplet deformation in a steady electric field. The mutual relation between the deformation parameter and magnetic nanoparticles concentration is analysed. Spatio-temporal analysis of the droplet shape is presented in the paper. The phenomena of the droplet deformation was recorded by a camera. The detailed experimental procedure is presented. The method of deformation parameter calculation based on linear pixel as the smallest-size unit in digital image is written. Finally, the relation between the deformation parameter and the nanoparticle volume concentration, as well as the time and magnitude of the DC field application is thoroughly evaluated.