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New method for the determination of the particle magnetic moment distribution in a ferrofluid

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Abstract

We present a new method for the determination of the magnetic moment distribution $\rho(\mu)$ of ferrofluid particles from the magnetization curve measured on diluted ferrofluid samples in the liquid state. The method employs the solution of the standard integral equation describing the magnetization of a non-interacting particle system in the given external field as a convolution of the Langevin function with the distribution of particle moments. No *a priori* assumptions concerning the shape of the corresponding distribution are required. We present the reconstruction results obtained both for the computer simulated magnetization curves and for real experimental data. In the latter case we compare the distributions found using our algorithm with those calculated from the particle size distributions obtained via the electron microscopy images of the ferrofluid particles.