

The point dipole approximation in magnetic force microscopy

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Image interpretation in magnetic force microscopy (MFM) requires detailed information about the internal microstructure of the ferromagnetic tip used for probing the surface microfield of a sample. Since these informations are generally not experimentally available, image interpretation is more speculative than rigorously quantitative at the present time. This theoretical analysis confirms by a simple criterion that MFM image interpretation can be performed in terms of point dipole probing provided that some experimental constraints are satisfied. The validity of the criterion is demonstrated for various experimentally relevant examples.