

Imaging Magnetization Dynamics

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Abstract :

The static magnetization of small metallic ferromagnetic structures may be controlled easily. It is, for example, easy to tailor certain configurations of the static magnetization by controlling the shape of a micromagnetic element and various imaging techniques exist that allow observation of the domain structure with high spatial resolution.

For dynamic applications such as high speed switching, it is also important to be able to observe and possibly to control the dynamic magnetization on picosecond timescales. I will review a few examples for imaging magnetization dynamics in confined magnetic structures and address novel magnetic switching schemes using microwaves.

Furthermore, the dynamic magnetization may be used to transport magnetic information over large distances. In this case spin wave packets are excited which again can be imaged in space and time. In this talk I will show how spin wave packets can be imaged directly and how we can obtain the relevant dispersion relations for different spin wave modes. Data that demonstrates spin wave interferences will be presented.