

Spatial and dynamic control of magnetization with optically excited surface acoustic waves

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Magnetoelastic interaction is a non-inductive way of controlling the magnetization using static and dynamic strain. In previous works magnetization precession has been excited using quasi plane monochromatic acoustic waves generated electrically[1]. Here we propose a different approach: ultrafast laser pulses are used to generate broadband, isotropic surface acoustic waves(SAWs), which can excite the spin waves via the magnetoelastic coupling. Extensive studies of thin FeGa and Nickel films will be shown including the mapping of acoustic and magnetic signals. The influence of SAWs on the magnetization and the optimal conditions for coupling will be discussed.

References:

[1] Thevenard, L. et al. Phys. Rev. B 93, 134430 (2016).