Abstract Submitted
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Controlling spin-wave propagation with Oersted fields[1] K. VOGT, B. HILLEBRANDS, Technische Universitaet Kaiserslautern, H. SCHULTHEISS, J.E. PEARSON, F.Y. FRADIN, S.D. BADER, A. HOFFMANN, Argonne National Laboratory — The goal of magnon spintronics is to utilize the coherent propagation of spin waves for low-power data processing. Spin waves carry angular momentum and can transport spin information over distances much larger than the spin diffusion length of metals. However, in thin magnetic films the highly anisotropic dispersion relation leads to strong changes in the spin-wave energy for different angles between their propagation direction and the magnetization orientation. Consequently, spin waves only travel along a straight path if the magnetization direction is fixed by a global external magnetic field. We demonstrate that locally rotating magnetic fields generated via electric current pulses allow to vary the propagation direction of spin waves. Using spatially resolved Brillouin light scattering microscopy the propagation behavior was directly verified.[2] We have modeled the current generated magnetic fields with a finite element code and calculated the magnetic response using micro magnetic simulations.

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[2]K. Vogt, H. Schultheiss, S. Jain, J.E. Pearson, A. Hoffmann, S.D. Bader, and B. Hillebrands, Appl. Phys. Lett. **101**, 042410 (2012)

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