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Vortex-core reversal by rotating currents THOMAS KAMIONKA, MICHAEL MARTENS, MARKUS BOLTE, GUIDO MEIER, Institute of Applied Physics and Microstructure Research Center, University of Hamburg, Germany, BENJAMIN KRUEGER, I. Institute of Theoretical Physics, University of Hamburg, Germany, KANG WEI CHOU, TOLEK TYLISZCZAK, Advanced Light Source, LBNL, Berkeley, CA, USA, MICHAEL CURCIC, BARTEL VAN WAEYENBERGE, HERMANN STOLL, Max Planck Institute for Metals Research, Stuttgart, Germany — The investigation of the interaction between a spin-polarized current and the magnetization of a ferromagnet is of great interest. One concept for data storage is to use the current- induced switching of the vortex-core polarization, i.e. the out- of-plane component of the magnetization in the center of a micronsized permalloy element. It has been shown both theoretically [1] and experimentally [2] that the polarization can be switched selectively by resonant field excitation. We carried out time-resolved scanning transmission X-ray microscopy while exciting the vortex core with rotating currents of varying frequency, amplitude and rotation sense. We observed vortex core switching, and by analyzing the gyration phase with respect to the exciting current we derive whether the Oersted-field or the spin torque mainly contributes to the excitation and causes the switching process. [1] S. K. Kim et al., Appl. Phys. Lett. **92**, 022509 (2008). [2] M. Curcic et al., Phys. Rev. Lett. **101**, 197204 (2008).

Markus Bolte
Institute of Applied Physics and Microstructure Research Center,
University of Hamburg, Germany

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