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Time-resolved X-ray Microscopy of Magnetic Antivortex Dynamics MARKUS BOLTE, THOMAS KAMIONKA, MICHAEL MARTENS, BERND GUEDE, GUIDO MEIER, Institute of Applied Physics and Microstructure Research Center, 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 study of magnetic singularities, vortices and antivortices, has recently intensified as they have been suggested as non-volatile data storage elements or for spin-wave logic applications. Magnetic antivortices occur during the switching process of their topological counterparts, the vortices [1], as well as in crosstie-domain walls and special geometries [2]. Understanding the dynamics of antivortices [3] is therefore fundamental for gaining a detailed knowledge necessary to design new spintronic applications. Here we show by time-resolved X-ray microscopy experiments that magnetic antivortices indeed gyrate when excited by alternating currents, in agreement with theoretical models and micromagnetic simulations [3], albeit with much lower efficiency than their topological counterparts, the vortices. [1] B. Van Waeyenberge et al., Nature **444**, 461 (2006). [2] K.Shigeto et al., APL **80**, 4190, (2002). [3] A. Drews et al., PRB **77**, 094413 (2008); B. Krueger et al., JAP **103**, 07A501 (2008).

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