

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Soft X-ray Imaging of Vortex Dynamics in Trilayer Pattered Magnetic Elements BROOKE MESLER, Applied Science and Technology Graduate Group, University of California at Berkeley, DONG-HYUN KIM, Dept of Physics, Chungbuk National University, Korea, PETER FISCHER, Center for X-ray Optics, Lawrence Berkeley National Lab — Soft X-ray microscopy provides element specific magnetic imaging with a spatial resolution down to 15nm. At XM-1, the full-field soft X-ray microscope at the Advanced Light Source in Berkeley, a stroboscopic pump and probe setup has been developed to study fast magnetization dynamics in ferromagnetic elements with a time resolution of 70ps which is set by the width of the X-ray pulses from the synchrotron. Previous studies of patterned permalloy elements have revealed complex magnetization dynamics. Results obtained with a $2\mu\text{m} \times 4\mu\text{m} \times 45\text{nm}$ rectangular permalloy sample exhibiting a seven domain Landau pattern reveal dynamics up to several nsec after the exciting magnetic field pulse. Domain wall motion, a gyrotropic vortex motion, and a coupling between vortices in the rectangular geometry are observed. On going studies of patterned trilayer elements, composed of magnetic permalloy and cobalt layers separated by a copper spacer layer, will probe the dynamics of the trilayer system. Of particular interest is observing how the coupling between the magnetic layers affects the vortex dynamics.

Brooke Mesler
University of California at Berkeley

Date submitted: 08 Dec 2008

Electronic form version 1.4