Abstract Submitted
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Magnetization Dynamics of Magnetic Nano-Elements on Ultra-fast Time Scales.[1] J.P. DAVIS, J.A.J. BURGESS, University of Alberta, Z. LIU, R.D. SYDORA, M.R. FREEMAN, University of Alberta — Recently, our group has systematically studied the switching of a *single* permalloy nano-disk (160 nm diameter) between the vortex and quasi-single domain ground states as a function of applied bias field, including the observation of real-time switching at particular fields [1]. This was performed using the time-resolved magneto-optical Kerr effect (TR-MOKE), which allows dynamics to be studied on sub-nanosecond time scales. To accurately simulate the switching behavior, it was necessary to take into account the domed shape of the nano-disks, which result from the lift-off fabrication. Because of the sensitivity of the magnetization dynamics to the shape of the disks, we have begun fabrication of nano-disks using a shadow mask procedure [2] with a collimated deposition source under ultra-high vacuum (UHV) to produce high quality nano-elements. Magnetization dynamics of these UHV fabricated nano-disks will be discussed, with complementary scanning probe microscopy characterization of the disks.

1. Z. Liu, R.D. Sydora and M.R. Freeman, PRB **77**, 174410 (2008).
2. M.M. Deshmukh, D.C. Ralph, M. Thomas and J. Silcox, Appl. Phys. Lett. **75**, 1631 (1999).

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