

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Design, Construction, and Testing of MOKE Magnetometer¹

TIGHE BAILEY, CASEY W. MILLER, Rochester Inst of Tech — We report on the construction of a transverse magneto-optical Kerr effect (MOKE) magnetometer using various optical and electrical components. Uniquely, our MOKE magnetometer is able to sweep the magnetic field at frequencies greater than one Hz using lock in amplifiers to simultaneously sample the photodetector and the Hall sensor. The buffer of a lock-in amplifier allows for 512 samples per second, which allow us to rapidly sweep the magnetic field without loss of resolution. This drastically cuts down on the time taken per scan. To demonstrate the MOKEs capabilities, scans were performed on multiple thin film magnetic structures, both with and without significant magnetic anisotropy. We were able to measure room temperature hysteresis loops of ferromagnets, such as $\text{Ni}_{80}\text{Fe}_{20}$. Our sample rotation capabilities allowed us to study the angular dependence of the exchange and magnetocrystalline anisotropy in bilayer structures.

¹Supported by NSF 1515677

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Date submitted: 10 Nov 2016

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