

Abstract Submitted  
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**Magneto-optical Kerr probing of LAO/STO interface ferromagnetism**<sup>1</sup> JIANAN LI, QING GUO, FENG BI, MENGCHEN HUANG, Univ of Pittsburgh, HYUNGWOO LEE, CHANG-BEOM EOM, Univ of Wisconsin-Madison, PATRICK IRVIN, JEREMY LEVY, Univ of Pittsburgh — Interfacial ferromagnetism in LaAlO<sub>3</sub>/SrTiO<sub>3</sub> (LAO/STO) heterostructures has been probed by a variety of techniques. Recently, magnetic force microscopy (MFM) was used to image ferromagnetic domains that are electrically tunable at room temperature<sup>2</sup> when the samples were grown in certain conditions. Optical techniques provide powerful tools for probing magnetic phenomena, and recently magnetic circular dichroism has been observed in reduced bulk STO crystals<sup>3</sup>. Here we describe a scanning magneto-optical Kerr imaging system that could achieve sub-micrometer precision and  $10^{-4}$  rad/ $\sqrt{\text{Hz}}$  sensitivity with a 150 fs pulsed-laser centered at 425 nm. Such capability would make pump and probe measurement on the gate-tunable LAO/STO ferromagnetism and ultrafast imaging of domain dynamics possible.

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<sup>2</sup>F. Bi, *et al.* Nat. commun. **5**, 5019 (2014)

<sup>3</sup>W. D. Rice, *et al.* Nat. mater. **13**, 481487 (2014)

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