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Correlations between magnetic and piezoelectric response at gated $LaAlO_3/SrTiO_3$ interfaces[1] QING GUO, JIANAN LI, MENGCHEN HUANG, University of Pittsburgh, HYUNGWOO LEE, CHANG-BEOM EOM, University of Wisconsin-Madison, PATRICK IRVIN, JEREMY LEVY, University of Pittsburgh — The interface between perovskite oxide semiconductors $LaAlO_3$ and $SrTiO_3$ exhibits remarkable conducting, superconducting, magnetic, and spintronic properties that are strongly influenced by electron density. Scanning probe methods have the ability to probe local properties of interest. For example, magnetic force microscopy (MFM) has be used to measure magnetism at the $LaAlO_3/SrTiO_3$ interface[2], while piezoelectric force microscopy has been used to measure the local electron density[3]. Here we directly compare these two methods to provide further insight into the relationship between electron density and magnetic properties.

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[3]M. Huang, *et al.*, APL Mater. **1**, 052110 (2013).

Qing Guo
University of Pittsburgh

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