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Modulation of the low-temperature magnetoresistance of Ar-irradiated $SrTiO_3$ via field-effect gate doping J.H. NGAI, Department of Applied Physics, Yale University, Y. SEGAL, J. HOFFMAN, F.J. WALKER, C.H. AHN, CENTER FOR RESEARCH ON INTERFACE STRUCTURES AND PHENOMENA TEAM — Recent experiments have shown that irradiating single crystal $SrTiO_3$ with Ar ions can create an amorphous surface layer with a quasi-2-dimensional electron gas (Q2DEG) below. We present low-temperature magnetotransport measurements of this Q2DEG system, as a function of gate doping. The magnetoresistance can be tuned as n-type carriers are doped into the interface between the amorphous and crystalline $SrTiO_3$ layers. Anisotropy in the magnetoresistance is also measured with respect to the direction of the applied magnetic field. These results will be compared with the magnetotransport properties of $LaAlO_3$/ $SrTiO_3$ heterostructures, where the possibility of novel magnetic behavior will be discussed.

Joseph Ngai
Department of Applied Physics, Yale University

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