

Abstract Submitted  
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**Tuning 2D-2D tunneling in high mobility electron systems** JOHN BARTEL, MATTHEW PELLICCIONE, ADAM SCIAMBI, Stanford University, LOREN PFEIFFER, KEN WEST, Princeton University, DAVID GOLDHABER-GORDON, Stanford University — We present measurements on GaAs/AlGaAs bilayer two-dimensional electron systems (2DES) where the tunnel coupling between the 2DES is tunable with a gate. By designing a GaAs/AlGaAs heterostructure with a relatively low energy barrier between the 2DES, reducing the electron density with a gate lowers the effective barrier height between the 2DES and increases the tunnel coupling. We describe the fabrication process developed to realize these samples, along with measurements that take advantage of this tunable tunnel coupling to realize a novel transistor where the gate lies outside the channel region [1]. In addition, the suitability of these devices for scanning gate measurements will be discussed.

[1] A. Sciambi, M. Pelliccione *et al.*, Phys. Rev. B **84**, 085301 (2011).

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