

Abstract Submitted  
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**Radio frequency charge sensing and nuclear polarization of a two-electron double quantum dot**<sup>1</sup> DAVID REILLY, EDWARD LAIRD, Harvard University, JACOB TAYLOR, MIT, JASON PETTA, Harvard University / Princeton University, CHARLES MARCUS, Harvard University, MICAH HANSON, ART GOSSARD, University of California, Santa Barbara — We report charge-sensing measurements of a two-electron double quantum dot using an electrometer based on a radio-frequency quantum point contact (rf-QPC). In analogy with the radio frequency single electron transistor (rf-SET) the rf-QPC makes use of a LC impedance transformer and radio frequency reflectometry to achieve high charge sensitivity over a bandwidth exceeding 20MHz. In addition, we use controlled nanosecond pulsing of the double-dot potential to drive singlet to triplet transitions that develop a partial polarization of the nuclear spins. Using the rf-QPC, the subsequent diffusion and dynamics of nuclear polarization is examined on fast timescales.

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