Supplementary Material: Coherent Adiabatic Spin Control in the Presence of Charge Noise Using Tailored Pulses

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DEVICE STRUCTURE

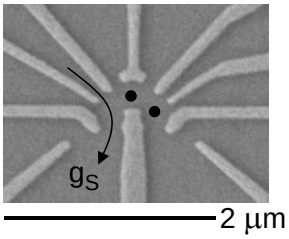

Figure 1. Scanning electron microscope image of a device identical to the one measured.

Measurements are performed on a device identical to the one shown in Fig. 1. The GaAs/AlGaAs heterostructure was grown using molecular beam epitaxy at the University of California Santa Barbara. A two-dimensional electron gas is located approximately 110 nm below the surface of the wafer and has a density of $\sim 2 \times 10^{11}/\mathrm{cm}^2$ and a mobility of 200,000 $\mathrm{cm}^2/(\mathrm{Vs})$. Ti/Au depletion gates are arranged in a triple quantum dot geometry. For the purpose of this experiment, two dots are used to form the double quantum dot and the third dot is used as a charge sensor. The charge sensor conductance, g_S, is measured using standard lock-in detection with 0.3 nA current bias. Convolved pulses are generated using a Tektronix AWG5014 arbitrary waveform generator. Mini-Circuits series SBLP passive filters are used to smooth the voltage pulse profile. Double hat pulses are generated using the AWG7122B arbitrary waveform generator, which has a sampling rate of 12 GS/s. Pulses are sent to the sample via high frequency semi-rigid coax lines. The device is cooled in an Oxford Instruments model HA400 dilution refrigerator.