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**Electrical Detection of a Single Electron Spin in the SiO<sub>2</sub> of a Si Field Effect Transistor**

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For electron spin based quantum information processing in semiconductor, it is necessary to determine the spin orientation of a single electron. We have been able to identify the spin state and perform magnetic resonance measurements, for a single paramagnetic spin center residing in the SiO<sub>2</sub> of a sub-micrometer Si field effect transistor. At certain bias points, the transistor current experiences random telegraph signal (RTS), arising from the stochastic switching of the paramagnetic spin center between two charge states. RTS turns out to be a sensitive probe of the center's spin orientation. Using microwave radiation at frequencies ranging from 16 - 50 GHz, electron spin resonance (ESR) for our paramagnetic spin center was obtained, corresponding to a g-factor of  $2.02 \pm 0.015$ . On the basis of these results, we will introduce a scheme for an electrical projective single-shot spin-state read-out and our preliminary experimental results.