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Measurement of Valley Kondo Effect in a Si/SiGe Quantum Dot 1 MINGYUN YUAN, ZHEN YANG, CHUNYANG TANG, A.J. RIMBERG, Department of Physics and Astronomy, Dartmouth College, R. JOYNT, D.E. SAVAGE, M.G. LAGALLY, M.A. ERIKSSON, University of Wisconsin-Madison — The Kondo effect in Si/SiGe QDs can be enriched by the valley degree of freedom in Si. We have observed resonances showing temperature dependence characteristic of the Kondo effect in two consecutive Coulomb diamonds. These resonances exhibit unusual magnetic field dependence that we interpret as arising from Kondo screening of the valley degree of freedom. In one diamond two Kondo peaks due to screening of the valley index exist at zero magnetic field, revealing a zero-field valley splitting of $\Delta \approx 0.28$ meV. In a non-zero magnetic field the peaks broaden and coalesce due to Zeeman splitting. In the other diamond, a single resonance at zero bias persists without Zeeman splitting for non-zero magnetic field, a phenomenon characteristic of valley non-conservation in tunneling.

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