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Coupling a Si/SiGe quantum dot to an implanted phosphorus donor RYAN H. FOOTE, DANIEL R. WARD, BRANDUR THORGRIMSSON, University of Wisconsin - Madison, J.R. PRANCE, Lancaster University, Lancaster, UK, ANDRE SARAIVA, D.E. SAVAGE, MARK FRIESEN, S.N. COPPERSMITH, M.A. ERIKSSON, University of Wisconsin - Madison — We have fabricated quantum dots in a Si/SiGe heterostructure both with and without implanted phosphorus donors. We present the results of transport measurements at dilution refrigerator temperatures through both types of devices. In one device we see evidence of coupling between a dot and a localized state consistent with a donor. We present estimates of the position of the localized state using Coulomb blockade measurements as a function of several different gate voltage configurations. This research supported in part by NSF (DMR-1206915) and ARO (W911NF-12-1-0607). Development and maintenance of the growth facilities used for fabricating samples is supported by DOE (DE-FG02-03ER46028). This research utilized facilities supported by the NSF (DMR-1121288).

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