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Measurements of undoped accumulation-mode SiGe quantum dot devices KEVIN ENG, MATHEW BORSELLI, KEVIN HOLABIRD, IVAN MILOSAVLJEVIC, ADELE SCHMITZ, PETER DEELMAN, BIQIN HUANG, MARKO SOKOLICH, LESLIE WARREN, THOMAS HAZARD, ANDREY KISELEV, RICHARD ROSS, MARK GYURE, ANDREW HUNTER, HRL Laboratories, LLC — We report transport measurements of undoped single-well accumulation-mode SiGe quantum dot devices with an integrated dot charge sensor. The device is designed so that individual forward-biased circular gates have dominant control of dot charge occupancy, and separate intervening gates have dominant control of tunnel rates and exchange coupling. We have demonstrated controlled loading of the first electron in single and double quantum dots. We used magneto-spectroscopy to measure singlet-triplet splittings in our quantum dots: values are typically $\sim$0.1 meV. Tunnel rates of single electrons to the baths can be controlled from less than 1 Hz to greater than 10 MHz. We are able to control the (0,2) to (1,1) coupling in a double quantum dot from under-coupled ($t_c < kT \sim 5\mu eV$) to over-coupled ($t_c \sim 0.1$ meV) with a bias control of one exchange gate. Sponsored by the United States Department of Defense. Approved for Public Release, Distribution Unlimited. The views expressed are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

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