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A split accumulation gate architecture for silicon MOS quantum dots SOPHIE ROCHETTE, Institut quantique, Université de Sherbrooke, MARTIN RUDOLPH, Sandia National Laboratories, ANNE-MARIE ROY, Université de Sherbrooke, MATTHEW CURRY, University of New-Mexico, Sandia National Laboratories, GREGORY TEN EYCK, JASON DOMINGUEZ, RONALD MANGINELL, TAMMY PLUYM, JOHN KING GAMBLE, MICHAEL LILLY, Sandia National Laboratories, CHLOÉ BUREAU-OXTON, Institut quantique, Université de Sherbrooke, Sandia National Laboratories, MALCOLM S. CARROLL, Sandia National Laboratories, MICHEL PIORO-LADRIÈRE, Institut quantique, Université de Sherbrooke, QISP CIFAR — We investigate tunnel barrier modulation without barrier electrodes in a split accumulation gate architecture for silicon metal-oxide-semiconductor quantum dots (QD). The layout consists of two independent accumulation gates, one gate forming a reservoir and the other the QD. The devices are fabricated with a foundry-compatible, etched, poly-silicon gate stack. We demonstrate 4 orders of magnitude of tunnel-rate control between the QD and the reservoir by modulating the reservoir gate voltage. Last electron charging energies of app. 10 meV and tuning of the ST splitting in the range 100-200 ueV are observed in two different split gate layouts and labs. This work was performed, in part, at the Center for Integrated Nanotechnologies, an Office of Science User Facility operated for the U.S. Department of Energy (DOE) Office of Science. Sandia National Laboratories is a multi-program laboratory operated by Sandia Corporation, a Lockheed-Martin Company, for the U. S. Department of Energy under Contract No. DE-AC04-94AL85000.

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