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Pauli spin blockade in CMOS silicon double dots probed by dual gate reflectometry[1] DHARMRAJ KOTEKAR PATIL, CEA-INAC and Universit Grenoble Alpes, 17 Rue des Martyrs, F-38000 Grenoble, France, ALESSANDRO CRIPPA, Laboratorio MDM, CNR-IMM, ROMAIN MAURAND, ANDREA CORNA, CEA-INAC and Universit Grenoble Alpes, ROMAIN LAVIEVILLE, LOUIS HUTIN, SYLVAIN BARRAUD, CEA, LETI, MINATEC Campus, ALEXEI ORLOV, University of Notre Dame, Notre Dame, SILVANO DE FRANCESCHI, MARC SANQUER, XAVIER JEHL, CEA-INAC and Universit Grenoble Alpes, TEAM TEAM, COLLABORATION COLLABORATION, COLLABORATION COLLABORATION, TEAM TEAM, COLLABORATION COLLABORATION — Silicon quantum dots are attractive candidates for the development of scalable spin-based qubits. The Pauli spin blockade effect in double quantum dots can provide an efficient, temperature-independent mechanism for qubit readout. Here we report the observation of Pauli blockade in silicon double quantum dots defined in double-gate nanowire transistors fabricated using silicon-on-insulator CMOS technology. Each of the two gates is connected to an LC resonator to perform radio-frequency reflectometry. This powerful technique allows high-sensitivity detection of charge transitions in the double quantum dot down to the few-electron regime. We find evidence of Pauli spin blockade and study the magnetic-field dependence of the underlying singlet-triplet states.

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