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**Gate sensing coherent charge oscillations in a silicon field-effect transistor.**[1] M. FERNANDO GONZALEZ-ZALBA, Hitachi Cambridge Laboratory, UK, SERGEY SHEVCHENKO, B. Verkin Institute for Low Temperature Physics and Engineering, Ukraine, SYLVAIN BARRAUD, CEA-LETI, France, J. ROBERT JOHANSSON, CEMS, RIKEN, Japan, ANDREW FERGUSON, Cavendish Laboratory, UK, FRANCO NORI, CEMS, RIKEN, Japan, ANDREAS BETZ, Hitachi Cambridge Laboratory, UK — We report the observation of coherent charge oscillations in a double quantum dot formed in a silicon nanowire transistor detected via its dispersive interaction with a radio-frequency resonant circuit coupled via the gate. Differential capacitance changes at the inter-dot charge transitions allow us to monitor the state of the system in the strong-driving regime where we observe the emergence of Landau-Zener-Stückelberg-Majorana interference on the phase response of the resonator. A theoretical analysis of the dispersive signal demonstrates that quantum and tunnelling capacitance changes must be included to describe the qubit-resonator interaction. Furthermore, a Fourier analysis of the interference pattern reveals a charge coherence time, $T_2 = 100$ ps. Our results demonstrate charge coherent control and readout in a simple silicon transistor and open up the possibility to implement charge and spin qubits in existing complementary metal-oxide-semiconductor technology.

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