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Readout of single spins via Fano resonances in quantum point contacts LEV MOUROKH, Stevens Institute of Technology, ANATOLY SMIRNOV, VADIM PULLER, JONATHAN BIRD — We examine the feasibility of performing single-spin readout in a small quantum dot (SQD), using a quantum point contact (QPC) that is coupled to it by a larger dot with a quasi-continuous spectrum. When the Fermi energy in the QPC is approximately equal to one of the discrete levels of the SQD, a Fano resonance is observed in its conductance. We propose a procedure that uses such Fano peaks to determine the spin projection of a single electron in the SQD, in the presence of an external magnetic field that causes Zeeman splitting of its levels. We also show that this structure can exhibit Rabi oscillations when subject to microwave irradiation.

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