

Single-shot readout of an electron spin in silicon

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We report the experimental demonstration of single-shot time-resolved readout of an electron spin in silicon¹. The device consists of implanted phosphorus donors, coupled to a metal–oxide–semiconductor single-electron transistor^{2,3}. We observed a spin lifetime of ~ 6 seconds at a magnetic field of 1.5 tesla, and achieved a spin readout fidelity exceeding 90 percent. High-fidelity single-shot spin readout in silicon opens the way to the development of a new generation of quantum computing and spintronic devices based on silicon⁴.

¹A. Morello et al. *Nature* **467**, 687-691 (2010)

²S. J. Angus et al. *Nano Letters* **7**, 2051-2055 (2007)

³A. Morello et al. *Physical Review B* **80**, 081307(R) (2009).

⁴K. Y. Tan et al., *Nano Lett.* **10**, 11 (2010).