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Spin Transport in Silicon¹

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Silicon has been broadly viewed as the ideal material for spintronics due to its low atomic weight, lattice inversion symmetry, and near lack of nuclear spin, resulting in exceptionally long spin lifetime. Despite this appeal, however, the experimental difficulties of achieving coherent spin transport in silicon were overcome for the first time only recently, by using unique spin-polarized hot-electron injection and detection techniques. [1] Our subsequent observations of very long spin lifetimes and transit lengths [2] have impact on prospects for Silicon spintronics as the basis for a new paradigm of information processing.

[1] Ian Appelbaum, Biqin Huang, and Douwe J. Monsma, “Electronic measurement and control of spin transport in silicon,” *Nature* 447, 295 (2007).

[2] Biqin Huang, Douwe J. Monsma, and Ian Appelbaum, “Coherent spin transport through a 350-micron-thick silicon wafer,” *Phys. Rev. Lett.* 99, 177209 (2007).

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