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Magnetotransport in Ge/Si Quantum Dot Molecules Fabricated by Directed Self-Assembly[1] DONGYUE YANG, Department of Physics and Astronomy, University of Pittsburgh, CHRIS PETZ, Department of Materials Science and Engineering, University of Virginia, JEREMY LEVY, Department of Physics and Astronomy, University of Pittsburgh, JERROLD FLORO, Department of Materials Science and Engineering, University of Virginia — The electronic states of strained self-assembled Ge quantum dots embedded in silicon provide an attractive system for controlling electron spin interactions via direct exchange[2] . Directed self-assembly of sub-10 nm Ge islands are fabricated to produce laterally coupled quantum dot molecules with geometrically-defined spin exchange couplings. Ge islands are coupled to the Si capping layer, and geometries can be defined that are suitable for either vertical or lateral transport. We describe low-temperature vertical magneto-transport measurements on individual and small arrays of Ge islands grown on SOI substrate. Characteristic features in the magnetotransport are observed that correspond to specific geometrical arrangements of the quantum dots.

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[2]C. E. Pryor, M. E. Flatte, and J. Levy, Applied Physics Letter **95**, 232103 (2009)

Dongyue Yang
Department of Physics and Astronomy, University of Pittsburgh

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