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Conductance peak splitting in coupled Si/SiGe quantum dots L.J. KLEIN, SRIJIT GOSWAMI, K.A. SLINKER, S.N. COPPERSMITH, M.A. ERIKSSON, University of Wisconsin Madison, J.O. CHU, P.M. MOONEY, IBM Watson — The fabrication and electrical characterization of double quantum dots in modulation doped Si/SiGe heterostructure are presented. Trench line defined quantum dots and in plane gates are fabricated by electron beam lithography and reactive ion etching. Low temperature transport measurements (0.2 K) show split Coulomb blockade peaks over a large range of voltages on the side gates. The split conductance peaks indicates a tunnel coupling between the pair of quantum dots and this coupling can be tuned by varying the voltages applied to the gates. The stability plot diagram of the double dot reveals similar conductance diamonds for the individual dots with well resolved excited states. The possible applications of tunnel coupled quantum dots for quantum information processing are discussed.

Levente Klein
University of Wisconsin Madison

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