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Insulating ferromagnetic (Ga,Mn)As with low Mn-doping B.L. SHEU, Physics Department and Materials Research Institute, Penn State University, R.C. MYERS, Center for Spintronics and Quantum Computation, University of California, Santa Barbara, N. SAMARTH, Physics Department and Materials Research Institute, Penn State University, D.D. AWSCHALOM, Center for Spintronics and Quantum Computation, University of California, Santa Barbara, P. SCHIFFER, Physics Department and Materials Research Institute, Penn State University
— We probe the onset of ferromagnetism in (Ga,Mn)As near the vicinity of the metal-insulator transition by studying systematic series of low Mn-doped (< 2.0 atomic %) GaAs epilayers [growth described in R.C. Myers *et al.* Phys. Rev. B **74**, 155203 (2006)]. We have studied the temperature dependent magnetization and electronic transport properties of these insulating samples. We fit the data using the variable-range-hopping conduction model and calculate the hopping energy from the logarithm of the resistivity versus $T^{-1/4}$ slope fit. Our results indicate that a cutoff in ferromagnetism is strongly correlated with critical values of the electric conductivity and the hopping energy. This work is supported by grants from NSF, ONR and DARPA.

Ben-Li Sheu
Physics Department and Materials Research Institute,
Penn State University, University Park, Pennsylvania 16802, USA

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