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Conclusive Evidence for Impurity Band Conduction in Metallic $Ga_{1-x}Mn_xAs$ K.S. BURCH, MPA-CINT, Los Alamos National Laboratory, D.B. SHREKENHAMER, Department of Physics, University of California, San Diego, E.J. SINGLEY, Department of Physics, California State University, East Bay, J. STEPHENS, Center for Spintronics and Quantum Computation, University of California, Santa Barbara, B.L. SHEU, Department of Physics and Materials Research Institute, The Pennsylvania State University, R.K. KAWAKAMI, Department of Physics, University of California, Riverside, D.D. AWSCHALOM, Center for Spintronics and Quantum Computation, University of California, Santa Barbara, N. SAMARTH, P. SCHIFFER, Department of Physics and Materials Research Institute, The Pennsylvania State University, D.N. BASOV, Department of Physics, University of California, San Diego — The electronic structure and carrier dynamics of the dilute magnetic semiconductor $Ga_{1-x}Mn_xAs$ are studied via optical spectroscopy. We focus on the changes induced by annealing the samples, which is known to result in a large increase in the critical temperature. This study provides conclusive evidence that the Fermi energy (E_F) lies in a metallic impurity band.

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