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Infrared longitudinal and Hall conductivities in $Ga_{1-x}Mn_xAs$ films GHEORGHE ACBAS, M.-H. KIM, J. CERNE, Physics Dept. Univ. at Buffalo, SUNY, Buffalo, NY, M. CUKR, V. NOVAK, T. JUNGWIRTH, , Institute of Physics, Acad. of Sciences of the Czech Republic, Prague, Czech Republic, J. SINOVA, Physics Dept., Texas A&M Univ., College Station, TX — We determine the complete infrared (0.1-1.2 eV) magneto-conductivity tensor of a series of $Ga_{1-x}Mn_xAs$ films from the complex Faraday and Kerr angles as outlined in M.-H. Kim, et al., Phys. Rev. B 75, 214416 (2007). A systematic series of samples with varying Mn and hole concentrations is studied. The samples range from insulating to metallic. The frequency dependence of the real part of the longitudinal conductivity σ_{xx} is consistent with the values determined from transmission and reflection measurements. The complex transverse (Hall) conductivity σ_{xy} shows resonances associated with the inter-valence band transitions. As the Mn concentration decreases these transitions become broadened due to increased disorder. The temperature dependence shows non-monotonic behavior with sign changes at certain wavelengths. The data is compared with predictions from a disordered valence band model (T. Jungwirth, et al., Phys. Rev. B 76, 125206 (2007)). This work is supported by the Research Corporation Cottrell Scholar Award (Buffalo and Texas A\&M), NSF-CAREER-DMR0449899 (Buffalo), an instrumentation award from the CAS, Univ. at Buffalo, ERAS-CT-2003-980409 (Prague)and NSF-CAREER-DMR-0547875 (Texas A\&M).

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