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**Faraday and Kerr effect studies in optimally annealed $Ga_{1-x}Mn_xAs$ random alloys.**[1] GHEOGHE ACBAS, A. MARKELZ, J. CERNE, Physics Dept., Univ. at Buffalo, SUNY, Buffalo, NY, M. CUKR, V. NOVAK, Institute of Physics, Acad. of Sciences of the Czech Republic, Prague, Czech Republic, J. SINOVA, Physics Dept., Texas A&M Univ., College Station, TX — The mid-infrared (MIR: 115-366 meV) complex Faraday and Kerr effect are studied in $Ga_{1-x}Mn_xAs$ random alloy films (x = 0.05, and x = 0.07) as a function of frequency and temperature. The samples are optimally annealed with $T_C$ around 100K. The strong MIR magneto-optical response shows clear ferromagnetic behavior that is consistent with dc magnetization measurements. The real and imaginary parts of the measured Faraday and Kerr angles are in qualitative and quantitative agreement with the values predicted by an effective Hamiltonian model within a mean field treatment [E. M. Hankiewicz , J. Sinova et al., PRB 2004]. The Kerr and Faraday rotation peak at approximately 220 meV, which is consistent with theoretical predictions.

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