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Electronic structure of ferromagnetic $\text{Ga}_{1-x}\text{Mn}_x\text{As}$ probed by infrared to visible magneto-optical spectroscopy GHEORGHE ACBAS, Physics Dept. Univ. of Pittsburgh, Pittsburgh PA, M.-H. KIM, C. ELLIS, 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, Dept., Texas A&M Univ., College Station, TX — We present a study of the electronic band structure of ferromagnetic $\text{Ga}_{1-x}\text{Mn}_x\text{As}$ determined from the spin dependent optical transitions that are manifested in the Faraday and Kerr spectra in the infrared to visible range (100-2000 meV). The data are compared to predictions from conventional mean field p-d exchange model. The spin-split band structure is probed as function of the exchange interaction strength and carrier concentration by exploring a series of optimally annealed $\text{Ga}_{1-x}\text{Mn}_x\text{As}$ films with a broad range of magnetic doping ($x=0.01-0.14$) and Curie temperatures (up to 190K). Large shifts in the magneto-optical spectra are observed with varying Mn concentration, consistent with valence band models (Acbas et al., Phys. Rev. Lett. 103, 137201 (2009)).

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