

Abstract Submitted
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The role of Mn acceptors in determining the Zeeman splitting of the band edges in GaMnAs.¹ R. CHAKARVORTY, Y. -Y. ZHOU, Y. -J. CHO, X. LIU, J. K. FURDYNA, M. DOBROWOLSKA, Department of Physics, University of Notre Dame, IN 46556 — It has been widely accepted that ferromagnetism in Ga_{1-x}Mn_xAs is carrier-induced, and much work has been devoted to the mechanism of coupling between the Mn ions. By comparison considerably less attention has been given to the interaction of Mn ions with electronic bands, and to the Zeeman splitting of the band edges. To address the latter issue, we use magnetic circular dichroism (MCD) to investigate how different Mn acceptor states (neutral A⁰ vs. negatively charged A⁻) affect the magneto-optical properties of Ga_{1-x}Mn_xAs. Several series of Ga_{1-x}Mn_xAs layers were fabricated for this purpose by low-temperature molecular beam epitaxy, using different Mn concentrations ($0.001 \leq x \leq 0.01$), As₂ fluxes, growth temperatures and co-dopings. Our MCD data show that in highly compensated samples (i.e., those rich in A⁻ centers) the Zeeman splitting of the band edges disappears, thus indicating that the exchange between band carriers and Mn spins takes place entirely via the A⁰ centers.

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