

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Magnetic Circular Dichroism (MCD) Studies on MOVPE Grown InMnSb and InMnAs¹ M.A. MEEKER, B.A. MAGILL, G.A. KHODAPARAST, Virginia Tech, D. SAHA, C.J. STANTON, University of Florida, S. MCGILL, National High Magnetic Field Laboratory, Florida, B.W. WESSELS, Northwestern University — Carrier-induced ferromagnetism in magnetic III-V semiconductors has opened up several opportunities for device applications as well as for fundamental studies of a material system in which itinerant carriers interact with the localized spins of magnetic impurities. The origin of the carrier-induced ferromagnetism is still an open and exciting question. In order to understand the hole mediated ferromagnetism, probing the band structure in these material systems is crucial. Here we present magnetic circular dichroism (MCD) studies on MOVPE grown InMnSb and InMnAs, both with Curie temperatures above 300K. The measurements were performed on samples with different Mn contents, with the laser excitation energy tuned from 0.92-1.45eV, and external magnetic fields ranging up to 31 Tesla. The measurements are compared with MCD calculations based on an 8 band Pidgeon-Brown model. Comparison of the experimental results with the theoretical calculations provides a direct method to estimate the sp-d Mn- electron/hole coupling constants.

¹This work was supported by the NSF through grant: DMR-0846834 Career Award, DMR-1105437, and DMR -1305666. Also supported by the Institute of Critical Technology and Applied Sciences (ICTAS) at Virginia Tech.

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Date submitted: 11 Nov 2014

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