SES16-2016-000037

Abstract for an Invited Paper
for the SES16 Meeting of
the American Physical Society

High Field Magneto-Optical Studies of Ferromagnetic InMnSb and InMnAs: Spin-Orbit-Split Hole Bands and g-Factors[1]

GITI KHODAPARAST, Virginia Tech

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 begin to understand the hole mediated ferromagnetism, probing the band structure in these material systems is crucial. Here we present Cyclotron Resonance (CR) and Magnetic Circular Dichroism (MCD) studies on InMnSb and InMnAs films. The measurements were performed on samples with different Mn contents and external magnetic fields ranging up to 120 Tesla for the CR, and 31 Tesla for the MCD measurements. We compared Landau level and band structure calculations with our experimental measurements. [1-4].

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Collaborators: Brenden Magill and Michael Meeker: Virginia Tech, Christopher J. Stanton and Dipta Saha: Univ. of Florida, Bruce Wessels, Northwestern Univ., Jacek Furdyna and Xinyu Li: Univ. of Notre Dame, Yasuhiro Matsuda, Univ. of Tokyo (Kashiwa), Steve McGill, NHMFL.

[1]Supported by the NSF grants: DMR-0846834 Career Award, DMR-1105437, DMR -1305666, and AFOSR-FA9550-14-1-0376. A portion of this work was performed at NHMFL, which is supported by NSF Cooperative.