

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Ferromagnetism in InMnAsP epitaxial films NIDHI PARASHAR, PHILIP CHIU, BRUCE WESSELS, Northwestern University — The magnetic properties of epitaxial $\text{In}_{1-x}\text{Mn}_x\text{As}_{1-y}\text{P}_y$ deposited by metal-organic vapor phase epitaxy were investigated in order to study matrix effects. Alloy concentrations of $0.01 < x < 0.04$ and $0.10 < y < 0.25$ were evaluated. Films have excellent crystallinity with x-ray rocking curve width of 0.14 degrees. Films were ferromagnetic over the entire composition range studied. The field cooled and zero field cooled magnetization curves exhibit irreversible behavior. A T_c of 318 K was also measured from the field cooled magnetization temperature dependence. Both the irreversibility and the T_c are indicative of the formation of hexagonal MnAs precipitates. The presence of phosphorus promoted the nucleation of hexagonal MnAs precipitates, presumably as the result of the larger mismatch between the matrix and metastable cubic MnAs clusters, as compared to InMnAs.

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Date submitted: 15 Nov 2006

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