Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Microstructure of Delta-Doped ZnSe:(Te, N) Grown by Migration Enhanced Epitaxy Y. GONG, Columbia University, I.L. KUSKOVSKY, Queens Colleg of CUNY, H. YAN, Y. GU, G.F. NEUMARK, I.C. NOYAN, Columbia University, M.C. TAMARGO, City Colleg of CUNY — It has been difficult to obtain good p-type ZnSe. A delta-doping technique, with N as an acceptor and Te as a "codopant" (ZnTe is easily doped p-type), was employed to obtain a net acceptor concentration $\sim 6\times10^{18}$cm^{-3}using small amounts of Te. To understand the doping mechanism, we performed HRXRD with synchrotron radiation (NSLS) complemented by optical absorption (OA) and reflection. Two samples grown on GaAs substrates without (A) and with (B) a ZnSe buffer layer were studied. Sample A is composed of 244 periods of delta-layers separated by 9ML spacers (nominally undoped ZnSe), whereas sample B contains 200 periods of delta-layers separated by 10ML spacers. The (004) ω-2θ scans show a narrow high-intensity peak due to substrate and a series of satellite peaks. The best fitting was obtained with δ-layer thickness $\sim$0.25ML for both samples. The average Te contents in spacers and delta-layers are 5% and 50% (A), and 3% and 60% (B). Finally, combining results of the reflection and OA, we estimated the optical band gap of samples A and B to be 2.75eV and 2.77eV, respectively. These correspond to Te compositions of $\sim$4.5% and $\sim$3.0%, which are in good agreement with results of the x-ray measurements. 1. W. Lin, et al. Appl. Phys. Lett. **76**, 2205 (2000)

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Date submitted: 01 Dec 2004 Electronic form version 1.4