

Abstract Submitted  
for the NWS05 Meeting of  
The American Physical Society

**W-doped  $\text{In}_2\text{O}_3$  thin films with high electron mobility**<sup>1</sup> PAUL F. NEWHOUSE, CHEOL-HEE PARK, DOUGLAS A. KESZLER, Department of Chemistry, Oregon State University, Corvallis OR, JANET TATE, Department of Physics, Oregon State University, Corvallis OR, PETER S. NYHOLM, Hewlett-Packard Company, Corvallis OR — High electron mobility thin films of  $\text{In}_{2-x}\text{W}_x\text{O}_{3+y}$  ( $0 < x < 0.075$ ) were prepared on fused  $\text{SiO}_2$  and yttria-stabilized zirconia (001) single crystal substrates by pulsed laser deposition. Best-case mobilities of 104 and 112  $\text{cm}^2/\text{Vs}$  were measured at room temperature for polycrystalline and textured films, respectively. Thin film compositional analysis revealed that the W concentration of the highest mobility films was consistently  $x \sim 0.03$ . A slight widening of the band gap was detected from films with increasing electron carrier density, and the electron effective mass calculated from Burstein-Moss theory was  $0.3m_e$ .  $\text{In}_{2-x}\text{W}_x\text{O}_{3+y}$  films have high visible transmittance of  $\sim 80\%$ .

<sup>1</sup>Supported by the National Science Foundation under Grant No. 0245386.

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Date submitted: 12 Apr 2005

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