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Soft X-Ray Spectroscopic studies of Intrinsic Quantum Well States, Shallow Core Level Hybridization, and Valence Band Structure in CdO and InN

L.F.J. PIPER, L. COLAKEROL, A. DEMASI, T.D. MOUSTAKAS, K.E. SMITH, Boston University, J. ZUNIGA-PÉREZ, V. MUNOZ-SANJOSÉ, Universitat de Valncia, ALEXEI FEDOROV, Advanced Light Source, LBNL, T. VEAL, C. MCCONVILLE, University of Warwick — InN and CdO are post-transition metal compounds that display significant metal-ligand shallow core level hybridization [1], and have recently been discovered to possess intrinsic quantum well states in electron accumulation layers near their surfaces [2]. We report here new synchrotron-based soft x-ray spectroscopic measurements of the electronic structure of CdO and InN single crystal thin films. Resonant x-ray emission spectroscopy has been employed to study the detailed valence band and shallow core level electronic structure, while high resolution angle-resolved photoemission spectroscopy was used to measure quantized electron subbands at the near-surface of both InN and CdO. [1]. L.F. J. Piper et al., Phys. Rev. B (2007) in press; [2]. L. Colakerol et al., Phys. Rev. Lett. 97, 237601, (2006)

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