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Observation of Quantized Electron Accumulation States in InN(0001–) LEYLA COLAKEROL, HAE-KYUNG JEONG, LUKASZ PLUCINSKI, SHANCAI WANG, ALEX DEMASI, KEVIN SMITH, Department of Physics, Boston University, PAPO CHEN , THEODORE MOUSTAKAS, Department of Electrical and Computer Engineering, Boston University — We report a study of the surface and bulk electronic structure of InN(0001–) thin films using high resolution synchrotron radiation excited angle-resolved photoemission. The InN thin films were grown by plasma-assisted molecular beam epitaxy on *c*-plane sapphire. Samples were cleaned both by annealing in ultra-high vacuum (UHV) and by cycles of nitrogen ion bombardment followed by UHV annealing. We have observed a series of quantized states above the Fermi level (E_F), for a narrow range of excitation energies and band momenta. These states have a parabolic dispersion around the surface Brillouin zone center and are due to an electron accumulation layer in the conduction band. The number of states observed is a function of annealing temperature . We observe an increase in the number of states following sputtering, which is likely due to segregation of In metal to the surface. Up to four individual free electron states are observed. Supported in part by the NSF, the U.S. ARO, and by the U.S. AFOSR. Experiments were performed at the NSLS.

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