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**HREELS, AES, and LEED of InN(000-1): Surface structure and electron accumulation** RUDRA BHATTA, BRIAN THOMS, MUSTAFA ALEVLI, NIKOLAUS DIETZ, Georgia State University — InN layers grown by high pressure chemical vapor deposition (HPCVD) have been studied using several surface sensitive techniques. Following argon sputtering and atomic hydrogen cleaning (AHC), Auger electron spectroscopy showed that surface contaminants had been removed and a 1x1 hexagonal low energy electron diffraction pattern demonstrated that the InN surface was well ordered. HREEL spectra of the atomic hydrogen cleaned layer show a Fuchs-Kliwer surface phonon at  $560\text{ cm}^{-1}$  and adsorbate loss peaks at  $3260$  and  $870\text{ cm}^{-1}$  assigned to N-H stretching and bending vibrations, respectively. These assignments are confirmed by isotopic shifts using deuterium. No surface In-H vibrations are observed indicating N-H termination of the surface and the film is N-polar. HREEL spectra also showed a broad loss features due to conduction band plasmon excitations. The plasmon excitation shifted to higher energy as the incident electron energy (and therefore the penetration depth) was decreased. This shift indicates that the surface has a higher plasma frequency than bulk of the InN layer, which in turn indicates the presence of a surface electron accumulation layer.

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