Motivation: electronic properties of InN

- MO generalized ellipsometry measurements show evidence for a thin electron accumulation layer and corroborate HREELS and C-V data.
- Bulk and surface electron concentration follow power law dependencies as a function of the InN layer thickness.
- Strong deviation of scaling factors of the true bulk electron concentration and counted dislocation densities suggests evidence for a new defect related doping mechanism – most likely point defects, previously thought to be thickness independent.
- Neutralization of surface donors might be easier for low background concentrations.
- Experimental evidence for a thin InN $\Gamma$-point effective mass value for polarization perpendicular to c-axis: $m_\parallel = 0.950 \pm 0.03 m_0$ and $m_\perp = 0.037 \pm 0.03 m_0$.

Far-infrared magnetooptic generalized ellipsometry

- Fingerprints of a thin electron accumulation/depletion layer in wurzite InN. Model calculations show distinct changes in the ellipsometric spectra if a charge depletion or accumulation layer is present. HREELS and C-V measurements have been reported in the literature.
- Recent publications on MO generalized ellipsometry:

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Zero-field ellipsometry spectra reveal thickness, phonon mode frequency and broadening parameters, static dielectric constants, plasma frequency and plasma broadening parameters of InN and GaN layers.

Standard ellipsometry (zero-magnetic-field)

Electron surface accumulation or depletion?

- Far-infrared magnetooptic generalized ellipsometry

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