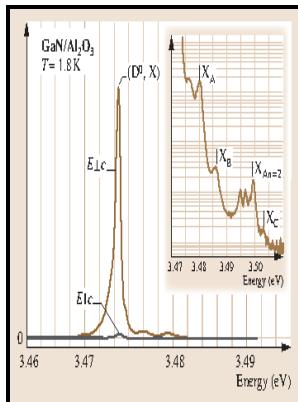


# III-nitride semiconductors - electrical, structural, and defects properties

Elsevier - III



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## Nitride Semiconductor

Thus, studies of quaternaries such as epitaxial GaInNAs and GaNAsSb are more common than those of ternary dilute nitrides. As off-axis holography is sensitive to the projected potential, we expect to observe the effect of the polarity on the potential in the structure. Figure 6 shows an EELS spectrum taken with the beam centered on the core, compared to one taken a few unit cells away Xin et al.

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The axial superlattice is enveloped by an AlN shell arising from the lateral growth during the deposition of the AlN sections. On the other hand, the measurement at the AlN top region presents a deviation from simulations, which might be due to charging of the NW under the electron beam. Previously we have demonstrated that GaN NWs are hexahedral structures with relatively flat  $\{10\bar{1}\bar{0}\}$  m-plane sidewall facets, and they exhibit N-polarity, as identified by annular bright field and high-angle annular dark field scanning transmission electron microscopy HAADF STEM den Hertog et al.

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The fringe spacing was 1 nm, giving a spatial resolution in the reconstructed phase image of around 3 nm. Growth on single crystal substrates of GaAs and Si is important because these wafers are of high quality and are available in large areas at relatively low cost.

## Nitride Semiconductor

PL measurements by Arnaudov et al.

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We verified that the step in phase over the AlN top region is consistent with the thickness and the MIP of AlN. In the last decade, III-nitrides have also attracted attention for the fabrication of intersubband ISB devices operating in the infrared domain. In this approach, the GaN epifilm is

transferred to a substrate with better thermal and electrical conductivity to improve the light extraction efficiency and drooping characteristics of GaN-based TFLED devices.

### III

However, our simulations do not include the variation in MIP between GaN and AlN; thus, the experimentally obtained potential profile was shifted along the y-axis to allow comparison to the simulated profiles. There is also great scientific interest in this class of materials because they appear to form the first semiconductor system in which extended defects do not severely affect the optical properties of devices. Taking these phenomena into account is critical to understand the physical properties of such nanostructures.

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