

**High-Resolution Polariton spectra of homoepitaxial GaN:  
Temperature dependence and Zeeman splitting**

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On a high quality homoepitaxial GaN layer grown by MOVPE on a pre-treated GaN single crystal we have measured with high resolution complete temperature-dependent series of reflectance (RF) and photoluminescence (PL) spectra.

In the reflectance spectra, intrinsic exciton-polariton features show up related to all three valence bands. For the A and B valence band, we find exceptional low damping. A full fit to the experimental curves including spatial dispersion allows to extract exact energies for a broad range of sample temperatures and reliable estimates for the masses.

The photoluminescence spectra show besides the dominant donor- and acceptor-bound excitons relatively strong, non-thermalized emission from exciton-polaritons in so-called bottleneck states. The analysis of these lines confirms the RF data.

For the ground and excited state of the A valence band related exciton-polariton we present Zeeman splitting data recorded in Faraday and Voigt configuration in magnetic fields up to 6 T. Different polarisations allow to distinguish multiple overlaid lines and to identify weaker, forbidden transitions.

**keywords:** polaritons, reflectance, PL, homoepitaxial GaN, Zeeman