Effect of the growth conditions on the early stages of pyramidal semipolar template growth — 

The structural investigation reveal the internal defects and gives an insight on the material quality in the pyramids and their facets. 

Determination of piezoelectric fields in GaN/InGaN/GaN quantum wells by DPC — 

An application of the technique to measure piezoelectric polarization fields inside multi-layered structures such as quantum wells is demonstrated. For this purpose, piezoelectric fields within non-centrosymmetric crystal structures, based on GaN/InGaN/GaN quantum wells, are investigated. It can be shown that the technique is sensitive to these fields and yields detailed and quantitative information about the field distribution. The specific information and experimental limitations will be discussed in detail and first measurements are shown. 

Investigation of the influence of InGaN underlying layers on the optical properties of InGaN quantum well structures — 

The optical properties of InGaN/InGaN multiple quantum wells (MQWs) with InGaN underlying layers (UL) on sapphire substrates have been comprehensively investigated by highly spatially and spectrally resolved cathodoluminescence microscopy (CL) at He temperature and by temperature dependent photoluminescence spectroscopy (PL). The InGaN layer thickness of the UL was systematically varied from 1% to 4% between the samples. SEM and AFM measurements were used to examine the sample morphology. The evaluation of the temperature dependent PL measurements shows a rising activation energy of nonradiative centers with increasing In content. CL investigations of the sample surface show elongated structures in the integral intensity images and peak wavelength images, which becomes more spot-like with rising In content. The peak energy of the MQW luminescence shows a blue shift with rising In content which may be caused by a reduction of the quantum confined Stark effect (QCSE). At the same time the FWHM of the MQW emission is reduced from 27 meV to about 18 meV when introducing ULs.