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Tip-enhanced Raman scattering of an InGaN/GaN quantum well on a single GaN nanorod EMANUELE POLIANI, MARKUS WAGNER, AXEL HOFFMANN, JANINA MAULTZSCH, Technische Universität Berlin, 10623 Berlin, Germany, JUAN SEBASTIAN REPARAZ, Catalan Institute of Nanotechnology, 08193 Bellaterra, Spain, MARTIN MANDL, WERNER BERGBAUER, MARTIN STRASSBURG, Osram Opto Semiconductors GmbH, 93055 Regensburg, Germany — Vertical GaN nanorods with double In0.2Ga0.8N/GaN quantum well were studied by tip-enhanced Raman spectroscopy (TERS). Exploiting the spatial resolution below the diffraction limit, we were able to perform a Raman map of the nanorod top part with 35 nm spatial resolution. Undetectable in the far field, enhanced phonons belonging to InGaN, InN rich regions and GaN were detected and analyzed as Raman shift map. These enhanced spatially resolved phonons revealed an Indium cluster region nucleated at the end of a planar dislocation in the GaN core. The dislocation continues inside the cluster area as an interface between zinclende and wurtzite modification. A narrow localized strain zone was found close to the interface on the zinc blende side surrounding material. On the wurtzite side instead, the Raman map of the GaN surface optical phonon revealed a more extended charge depletion region.

Emanuele Poliani
Technische Universität Berlin, 10623 Berlin, Germany

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