Combined analysis of the interplay between composition, strain, and luminescence at the nanoscale in quasi-bulk InGaN structures

K. Pantzas[1,2], G. Patriarche[1], M. Kociak[3], N. Cherkashin[4], M. Hÿtch[4], D. Troadec[5] et A. Ougazzaden[2]

[1] *Laboratoire de Photonique et de Nanostructures, Route de Nozay, 91460, Marcoussis*
[2] *Georgia Institute of Technology, 2 Rue Marconi, 57070, Metz*
[3] *Laboratoire de Physique de Solides, Université Paris Sud, Bât 510, 91405, Orsay*
[4] *CEMES, 29 Rue de Jarvig, 31055, Toulouse*
[5] *Institut d'Électronique de Microélectronique et de Nanotechnologie, Avenue Henri Poincaré, 59652, Villeneuve D'Asq*

Three advanced analytic microscopy techniques (quantified HAADF, holodark, STEM-CL) are combined for the first time to investigate the interplay between composition, strain, and luminescence in such InGaN quasi-bulk structures. A wealth of information on the material is thus acquired, allowing one to interpret strain and luminescence data acquired at the nanometer scale without having to make assumptions on the composition. This combination of techniques, providing information on chemistry, strain, and luminescence at the nanometer scale, sets the standard for the future of materials science studies using transmission electron microscopy.