**Investigation of AlInN/GaN heterostructures by scanning tunneling and transmission electron microscopy** — •Verena Portz[1], Jean-François Carlin[2], Raphaël Butté[2], Nicolas Grandjean[2], Rafal Dunin-Borkowski[1], and Philipp Ebert[1] — [1]Peter Grünberg Institut, Forschungszentrum Jülich GmbH, 52425 Jülich, Germany — [2]Institute of Condensed Matter Physics, École Polytechnique Fédérale de Lausanne, 1015 Lausanne, Switzerland

Ternary III-V semiconductors are of increasing interest for optoelectronic devices. One of the most promising alloys is $Al_{1-x}In_xN$, since it's band gap can be tuned from nearly 0.67 eV to 6.2 eV. Due to the high contrast of the refractive index, alternating layers of GaN and $Al_{1-x}In_xN$ are also commonly used in distributed Bragg reflectors (DBRs) for laser diodes. In these devices, the indium content is tuned to minimize lattice mismatch. Our investigations by scanning tunneling and transmission electron microscopy show that even in $Al_{1-x}In_xN$ layers, nominally lattice matched to GaN, compositional fluctuations can lead to stress and strain. The different strain and compositional effects are discussed.