



SEMINAIRE ISMO

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Evidence of carrier localization at the nanoscale induced by intrinsic alloy disorder in nitride semiconductor quantum heterostructures

Nitride LEDs for efficient solid-state lighting are produced since more than twenty years now. However, the nitride semiconductor technology developed partly on empirical basis and the microscopic mechanisms which govern the performances of nitride devices are still not fully identified. In particular, there is growing evidence that the intrinsic compositional disorder of the ternary alloys which are incorporated in the active region of LEDs may strongly impact the electronic processes. Indeed, these fluctuations of composition, which originate from the random positioning of the alloy atoms on the crystal lattice, induce spatial fluctuations in the potential seen by the carriers at the scale of a few nanometres. Because of the dramatic variation of the band gap with composition, these spatial fluctuations of the potential are expected to be extremely large and to lead to localization effects even at room temperature. We will present direct experimental evidences of carrier localization at the scale of alloy disorder in nitride quantum heterostructures. These experiments will be analysed in the framework of the recently developed localization landscape theory which provides the effective confining potential map stemming from compositional fluctuations.

Mardi 4 juin 2019 à 11 h
Amphithéâtre du bât 520 (3^{ème} étage)
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