

Abstract Submitted
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Role of Nitrogen on Emission Wavelengths of InAs Quantum Dots: InAs/GaAs Interfaces and Strain-compensating GaAsN Burying Layers I. SUEMUNE, S. GANAPATHY, K. UESUGI, Hokkaido Univ, N. MATSUMURA, RIKEN, Y. NABETANI, T. MATSUMOTO, Yamanashi Univ — Extension of emission wavelengths of InAs QDs longer than $1.3 \mu\text{m}$ has been difficult. Our group has demonstrated GaAsN strain-compensating layers (SCL) on InAs QDs and emission wavelength was extended to $1.55 \mu\text{m}$. Two main issues of physical origin extending wavelengths will be discussed. One is role of N at InAs/GaAs interfaces. Intentional “nitridation” of InAs QDs surfaces just before burying with GaAs layers was studied. From modeling of relation between lowest energy peak and QD-states energy separations, main factor for red-shift was attributed to suppression of Ga inclusion in InAs QDs, consistent with VFF model calculation. The other is study of compressive strain in InAs QDs and tensile strain in GaAsN SCLs with channeling in RBS, showing lattice constants parallel to surface remained unchanged and those normal to surface were extended in InAs QDs and shrunked in GaAsN SCLs, demonstrating effect of GaAsN SCLs.

I. Suemune
Hokkaido Univ

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