STRAIN-INDUCED LATERAL ORDERING AND QUANTUM EFFECTS IN SELF-ASSEMBLED GaInAs QUANTUM WIRES

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Abstract

GaInAs quantum wire (QWR) structures have been fabricated using the strain-induced lateral-layer ordering (SILO) process during molecular beam epitaxy. The SILO process is a one-step completely *in situ* self-assembly method for creating QWRs. The resultant dense array of QWRs has a low defect density, small quantum-like dimensions, and demonstrate strong lateral confinement. More importantly, the band gap of GaInAs QWRs grown by the SILO process responds to temperature changes in ways that deviate from the norm for III-V semiconductors. This band gap behavior with respect to temperature of SILO grown GaInAs QWRs is both physically interesting and potentially applicable to optoelectronic devices.