

# **Realization of Submicron-Pitch Linear Arrays of Nanometer-Sized InGaAs Ridge Quantum Wires by Selective MBE Growth on Patterned InP Substrates**

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## **Abstract**

By optimizing the whole growth process systematically, submicron-pitch linear arrays of nanometer-sized InGaAs ridge quantum wires (QWRs) were successfully realized by selective MBE on patterned InP substrates. Uniformity of QWR arrays was markedly improved by employing pre-growth etching, native oxide removal by atomic hydrogen cleaning, and optimization of V/III ratio. High optical quality of the fabricated submicron-pitch nanometer-sized InGaAs ridge QWR arrays was confirmed by achievement of an intense and narrow single PL emission peak with a peak width (FWHM) as small as 23meV. As compared with the previous 4 $\mu$ m pitch arrays, the PL peak of the submicron-pitch arrays showed a large blue shift of more than 100meV with respect to that from a reference planar QW grown simultaneously.