# Lateral Growth of High Quality InGaAs Bridge Layers by Liquid Phase Epitaxy

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$In_xGa_{1-x}As$ ternary semiconductors are very important materials for opto-electronic devices in the near infrared reqion. In this study, we have developed a new technique to grow high quality layers on patttered GaAs substrartes with trenches by liquid phase epitaxial method.

$In_xGa_{1-x}As$ (x=0.06, 0.10, 0.15) were grown on (111) B GaAs substrates in the form of bridges over the $\geqq 40$ $\mu$m deep trenches. The low etch pit densities and intense with sharp FWHM photoluminescence spectra obtained for $In_xGa_{1-x}As$ bridge layers showed the high quality and indicated that misfit dislocations and the dislocations from the substrate did not penetrarte into the grown bridge layers.

It was also possible to grow high quality InGaAs bridge layers on (111) A GaAs substrates as the growth of InGaAs from the trench bottom was effectively suppressed by depositing $Sin_x$ film over the trench bottom.

The excess or depletion of solute supply toward the trench bottom does not have any significant effect on the formation of bridge layers. The bridge layer formation was explained on the basis of the "Berg effect" when the follpwing two conditions were satisfied. (i)The growth front had a sharp edge ($54.7^\circ \leqq \phi \leqq 90^\circ$), and (ii) the grown layers were$\geqq 40$ $\mu$m. The higher quality of InGaAs bridge layer could be obtained by depositing $Sin_x$ film on parts of the side walls of the trench.

High quality InGaAs multilayers were grown on the bridge layer. (111) A GaAs substrate was suitable for growing InGaP layer.