MBE GROWTH AND PL STUDIES OF GAASSB/GAAS AND GAASSBN/GAAS QUANTUM WELL HETEROSTRUCTURES

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Single and multiple quantum well (QW) structures of GaAsSb/GaAs have been grown by Molecular Beam Epitaxy (MBE) for different compositions of Sb ranging from 17% to 33%, with corresponding shift in the PL peak positions from 1.125 eV to 0.98 eV. Low values of the full width at half maxima of the PL linewidth at 4K in the range of 17-23 meV and the presence of GaAs free exciton peak attest to the good quality of the QW heterostructures grown. Significant blue shifts in PL peak positions with laser intensity are observed. The effect of annealing on the PL spectra has also been examined.

Low temperature PL studies on GaAsSbN/GaAs QW structures have also been investigated. Variation of the band gaps of coherently strained GaAsSb and GaAsSbN epilayers with Sb and N compositions, respectively are determined using the results of the variational calculations of the excitonic transition in the above mentioned QW structures. A comparison of our results with the published data will also be presented.