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Bandgap engineering of InAs quantum dots using InGaAs and AlGaAs superlattice structures grown by molecular beam epitaxy

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We have studied the effect of AlGaAs/GaAs superlattice barriers and InGaAs quasi-monolayer with difference thicknesses on optical properties of InAs QDs by using photoluminescence (PL). Based on our results, the AlGaAs/GaAs superlattice barrier can effectively change the emission peak position of InAs QDs without much sacrificing the optical characteristics of QDs structures. This energy level shift could be explained by the energy level modification due to high potential barrier.

We also observed the possibility that InAs/InGaAs QDs system can be shifted toward longer wavelength. Further detailed research is undergoing.