Explanation of optical shift on $Ga_{1-x}In_xAs_ySb_{1-y}$/GaSb grown by Liquid- Phase Epitaxy

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$Ga_{1-x}In_xAs_ySb_{1-y}$ is a new semiconductor material, but its growth by liquid-phase epitaxy presents growing inhomogeneities seen as a 20 meV photoluminescence shift regarding photoreflectance at 12K. As we believe that the formation of low-dimensional structures during growth are responsible for this energy shift, we studied the optical emission spectra associated with the transition between the first conduction and valence band levels in spherical $Ga_{1-x}In_xAs_ySb_{1-y}$/GaSb quantum dots by using the experimental x and y values. Comparisons of our results with experimental data show that 15 nm QDs are possibly formed during the growth process.