INTERBAND FORMATION FOR A ?-DOPED LIKE GaAs/Al\textsubscript{x}Ga\textsubscript{1-x}As QW SUPERLATTICES.

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In this work we performed the local density of states computation for a ?-doped like GaAs/Al\textsubscript{x}Ga\textsubscript{1-x}As QW superlattices, and report the intermediate band (IB) formation as a function of several system parameters, the last one is caused by the overlapping of the wavefunctions of the constituent ?-doped like quantum wells. The ?-doped like QW shape and depth depends on the variation of the considered aluminium concentration $x$, and the IB width depend on the inter-well distance and the spacer layer width between ?-doped like QW. This work was performed using the nearest neighbors sp$^3$'s tight-binding model including spin. We find that the intermediate band width and relative position can be manipulated with the implementation of different spacer layers widths, the number of quantum wells and the variation of the aluminium concentration. This intermediate band formation is important for its possible implementation in solar cell devices (IBSC).

\textbf{Keywords:} LDOS, Intermediate band, AlGaAs/GaAs

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