

Effect of Spatially Correlated Disorder on Electronic Transport Properties of Aperiodic Superlattices (GaAs/Al_xGa_{1-x}As)

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Abstract : We examine the electronic transport properties in Al_xGa_{1-x}As/GaAs superlattices. Using the transfer-matrix technique and the exact Airy function formalism, we investigate theoretically the effect of structural parameters on the electronic energy spectra of trimer thickness barrier (TTB). Our numerical calculations showed that the localization length of the states becomes more extended when the disorder is correlated (trimer case). We have also found that the resonant tunneling time (RTT) is of the order of several femtoseconds.

Keywords : electronic transport properties, structural parameters, superlattices, transfer-matrix technique

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