Finite-T intra- and inter-wire pair correlation functions of a coupled electron-hole quantum wire system

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**Abstract**. We present a theoretical analysis of coupled electron-hole (*e-h*) quantum wire system's finite-temperature *T* intra- and inter-wire pair-correlation functions for some selected values of carrier number densities. The dynamics of intra- and inter-wire carrier (electron or hole) correlations is included using the frequency dependent local-field correction factor as obtained in the quantum analogue of the self-consistent mean-field theory of Singwi *et al* (the qSTLS approximation). Our study shows that in the coupled *e-h* system, holes in hole wire are more strongly correlated than the electrons in electron wire. Additionally, the decrease in carrier number density results in a monotonic increase in the inter-wire correlations.

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