Influence of correction factor on nearest neighbour hopping parameter in energy dispersion relation of Graphene nanoribbon

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ABSTRACT
We investigated on energy dispersion relation (E-KR) of graphene nanoribbon (GNR) considering its two prototypical shapes named as armchair GNR (AGNR) and zigzag GNR (ZGNR) but specially of AGNR in nearest neighbor interactions. Two parts \( \frac{A}{2} \) and \( (\hbar \gamma_3)^2 \) of E-KR relation have different characteristics independently expresses their importance. A correction factor \( \Delta \gamma_1 \) is used for hopping between two edge carbon atoms to count edge relaxation. Influence of this factor on hopping parameter exemplifies the edge bond relaxation effect in AGNR and ZGNR.

Keywords: Energy dispersion relation, graphene nanoribbon, nearest neighbor interactions, ballistic performance, correction factor, edge relaxation.