

A Novel Model for Saturation Velocity Region of Graphene Nanoribbon Transistor

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Abstract : A semi-analytical model for impact ionization coefficient of graphene nanoribbon (GNR) is presented. The model is derived by calculating probability of electrons reaching ionization threshold energy E_t and the distance traveled by electron gaining E_t . In addition, ionization threshold energy is semi-analytically modeled for GNR. We justify our assumptions using analytic modeling and comparison with simulation results. Gaussian simulator together with analytical modeling is used in order to calculate ionization threshold energy and Kinetic Monte Carlo is employed to calculate ionization coefficient and verify the analytical results. Finally, the profile of ionization is presented using the proposed models and simulation and the results are compared with that of silicon.

Keywords : nanostructures, electronic transport, semiconductor modeling, systems engineering

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