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Noise properties of graphene like systems[1] AVINASH RUSTAGI, C.J. STANTON, University of Florida — The unusual electronic properties of graphene and its potential for applications in nanoscale devices motivated us to study the noise properties of materials that have a graphene-like electronic dispersion. For high values of electric field, we find interesting behavior in the noise properties which appear due to hot electron effects. We study the low-frequency noise based on the Boltzmann-Green function method within the relaxation time approximation considering an inelastic scattering term coming from phonon scattering and an elastic scattering term coming from impurity scattering. The steady-state distribution function is evaluated to calculate the average behavior of physical observables like current and energy. We find that as the field strength is increased, the noise *decreases* from the thermal noise value. We have also studied these properties for electronic dispersion with a gap parameter introduced in the Dirac spectrum. The inclusion of gap in the electronic dispersion causes initial heating of the electrons resulting in an increase in noise for intermediate values of field before it decreases at high fields.

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