Homework Assignment for Bulk Monte Carlo Lab: Temperature Dependence of the Low Field Mobility for [100] Orientation of the Interface

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The figure below is from the paper:

The Monte Carlo method for the solution of charge transport in semiconductors with applications to covalent materials

Carlo Jacoboni and Lino Reggiani

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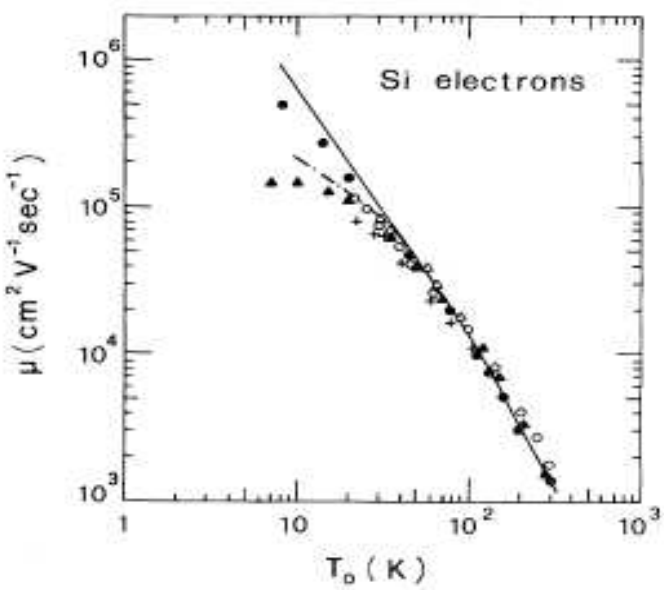

FIG. 26. Mobility of electrons in Si as a function of temperature. Different points refer to experiments: solid curve, theoretical results when lattice scattering only is considered; dot-dashed curve, theoretical results with lattice scattering plus ionized impurity scattering with $n_I = 10^{13}$ cm^{-3} (Canali *et al.*, 1975).

Use the Bulk Monte Carlo Lab to reproduce the temperature dependence of the electron mobility in Si for [100] orientation of the field. Use field strengths of 1 kV/cm to extract the low-field mobility value.

Note: Given the electric field strength the average drift velocity along the field and the mobility of the carriers are printed in the output log..