

ACUTE Exercise: 2D Scattering Rates

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Objective: The objective of this exercise is to calculate 2D scattering rate for polar optical phonon scattering.

1. Calculate the 2D scattering rate for polar optical phonon scattering. Assume GaAs quantum well with $L=150 \text{ \AA}$. Plot your results for the total scattering rate for electrons in the first subband as a function of the carriers kinetic energy (in-plane). Take into account three subbands in the well. Compare your answer with the 3D scattering rate due to POP for bulk GaAs (plot the two results on the same figure).

Recommended reading:

1. D. K. Ferry, Transport in Semiconductors
2. vasileska.faculty.asu.edu