**Monte Carlo Modelling of Electron Transport**

ELEC 4700 Assignment 1

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**Section 1**

1. VThermal is found using the following equation

Where kB=1.38066e-23 J/K, is Boltzmann’s constant, T =300K is the temperature and me is the mass of an electron and m0 is the rest mass of an electron. Me = 0.26\*9.11e-31kg = 2.3686e-31kg so vthermal becomes:

1. The mean free path is average distance electrons travel. We have the average velocity from above and the mean time between collisions is stated to be 0.2ps. Using a simple kinematics equation we get:
2. 2-D plot of particle trajectories

Figure : Temperature plot



**Section 2**

1. Histogram
2. 2-D plot of particle trajectories
3. Temperature plot
4. MFP and τmn

**Section 3**

1. 2-D plot of particle trajectories
2. Electron density map
3. Temperature map