

2. **Thermionic emission of electrons from a metal surface**

Assume that, to escape from a metal, an electron coming from the interior must collide with the surface with enough momentum to overcome the confining potential that holds the electrons in the metal. Also assume that all electrons with such a momentum do escape.

- (a) Calculate the flux (number per unit area per unit time) at room temperature  $T$  of electrons escaping from a metal with a work function  $\phi$  that is of the order of an electron-Volt. Treat the electrons as a non-relativistic ideal Fermi gas.