

1) In graphene, we have a linear relationship between energy and momentum:

$$E = v_F k = v_F \sqrt{(k_x)^2 + (k_y)^2} = v_F \sqrt{\left(\frac{n_x \pi}{L_x}\right)^2 + \left(\frac{n_y \pi}{L_x}\right)^2}$$

Derive the density of states vs. energy in graphene.

2) Now imagine you have a graphene nanoribbon. L_y is small. Calculate the density of states vs. energy of a 1d graphene nanoribbon.