

Homework 11

1. Read Marder pages 583-588. Look at Marder Figure 16.8 on page 430. This shows an open orbit and a electron “belly” orbit. Identify another type of closed “electron” orbit, and “hole” orbit. Hint for the latter: add an additional “sphere” to the diagram at the appropriate place. [The above are meant to be “thought” problems, not to be written up].
2. Suppose that in a given band the energy is

$$\epsilon_{\vec{k}} = \epsilon_0 + \frac{\hbar^2}{2m} (\alpha_x k_x^2 + \alpha_y k_y^2 + \alpha_z k_z^2).$$

Find the equations of motion that replace mass \times acceleration = force. Integrate the equations for a force \vec{F} due to a magnetic field \vec{B} in the z direction.

3. Do Sander problem 6 on page 170.
4. Read Sander pages 187-188.