

### **Problem Set #1:**

1. How many energy levels (projections along  $\underline{\mathbf{B}}_0$ ) are there for  $^{23}\text{Na}$ ? Draw an energy level diagram and label each energy level with values of  $m$  and  $I_z$ .
2. What is the Larmor frequency (both in rad/s and in Hz) for  $^{23}\text{Na}$  in a 7 T magnet?
3. How will the NMR sensitivity of  $^{23}\text{Na}$  compare to  $^1\text{H}$ ? Explain.
4. At what magnetic field do protons precess at 900 MHz?