

Physics 711 Homework Problems

1. You are to design a Stern-Gerlach experiment. In the following, whenever you assume something about the experiment, state it clearly. Of course, you must specify units for all physical quantities.
 - a) What is the magnetic moment of a silver atom?
 - b) What size magnet would you use? Decide on the strength of the magnetic field (in Tesla), the physical size of the pole pieces and their separation.
 - c) What is the largest value you expect for the field gradient along z ?
 - d) What force does a silver atom with spin pointing along z experience in that region and in which direction?
 - e) Assume something reasonable for the length of the section with this field gradient and for the distance to the screen. What is the separation of the two spots on the screen?
2. Sakurai problem 1.3.