ECE 18-316
INTRO TO DATA STORAGE
FALL 98
PROBLEM SET #6

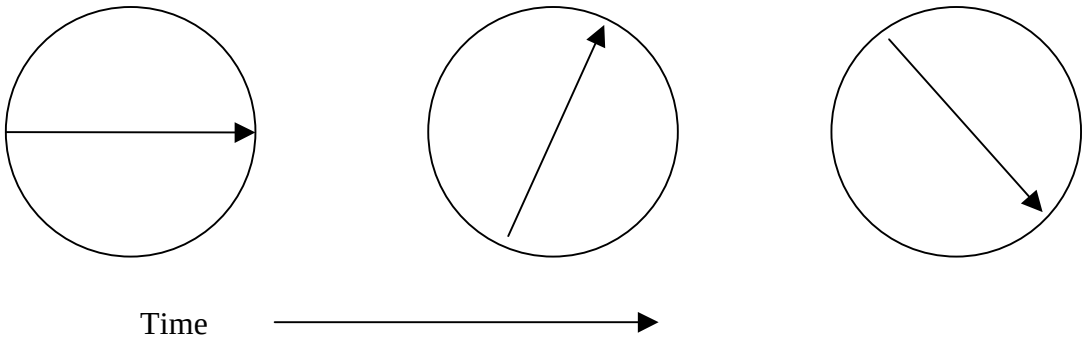
Due Friday, 10/9/98

In Class or To Jie Zou Before Start of Lab Section (1:30 PM)
Late submissions will not get credit

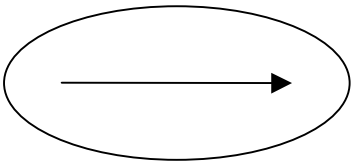
1. Sketch a cross section of a hard disk with a thin film medium. Label all the layers, indicate their function, and give representative materials.

2.
   a. Calculate the magnetic (demagnetization) energy for a single domain sphere of diameter d
   b. calculate the energy of a single domain wall running through the middle of the sphere
   c. estimate for cobalt the critical (values of A, K, etc. given in class) radius below which the particles are stable as single domains

3. Suppose I have a sphere of diameter d=1micron saturated with magnetization $M=10^6$ A/m. I observe that at room temperature the magnetization fluctuates randomly at a frequency 10^9.



Suppose I now deform this sphere into an ellipsoid with demagnetization factors N_a =½, N_b = ¼



How long is the magnetization stable?