

## Nuclear Lunch Questions

April 2<sup>nd</sup>, 2014

1. Why was Ytterbium chosen for this APV study? What other elements have been studied (with respect to APV)? **Andrea**
2. Is the interference proportional to  $Z^3$ ? If so why? Is the Stark effect proportional to  $Z^2$ ? If so why? **Cody**
3. What are the selection rules for atomic transitions? How are these different from selection rules for nuclear transitions (example decay)? **Sudhanva**
4. What is the syntax for labelling atomic states? Explain figure one in the Tsigutkin et al. PRL. **Tyler**
5. What do  $4f^{14}(^1S)6s5d$ ,  $4f^{13}(^2F_{7/2})5d_{3/2}6s^2$ , and  $(7/2, 3/2)_2$  represent? Which states participate in the mixing (see PRL 74, 4165)? In particular, does the  $^3D_1$  state mix with the F states? **Brian**
6. What is meant by modulation of an electric field? **Anthony**
7. What is the dynamic Stark effect? Why does it cause the asymmetry in figure 4? **Arbin**
8. What is nuclear anapole moment? **Shamim**
9. Why in figure 5 is there a 68% confidence band? What is special about 68%? What needs to be improved to reduce this error band? **Sushil**
10. Why is obtaining an improved result for  $\zeta$  interesting? **Everyone**