

# Physics 113 Quantum Theory Seminar

## Assignment 8 March 20, 2013

This week we learn about magnetic resonance and coupled angular momentum

### Part 1: Readings

**Zettili** - Chapter 7: Sections 7.1-7.3 Pages 391-424

**Boccio** - Chapter 9(Pages 722-743 Sections 9.4-9.5 ).

All new material.

Lots of problems this week

Start this assignment as early as possible.

### Part 2: Problems

1. Z7-30 Energy levels: 2 spin  $1/2$  particles
2. Z7-32 More Energy levels: 3 spin  $1/2$  particles
3. Boccio 9.7.14 Addition of Angular Momentum
4. Boccio 9.7.15 Spin = 1 system
5. Boccio 9.7.17 Spherical Harmonics
6. Boccio 9.7.18(part 2) Spin in Magnetic Field - Time Development Operator
7. Boccio 9.7.18(part 3) Spin in Magnetic Field - Density operator
8. Boccio 9.7.21 Multiple magnetic fields
9. Boccio 9.7.23 Magnetic Resonance
10. Boccio 9.7.24 More addition of angular momentum
11. Boccio 9.7.41 Two Stern-Gerlach Boxes
12. Boccio 9.7.53 Two Spins in a magnetic Field