

Physics 295. Independent Study on Advanced Quantum Field  
Theory. Professor Dine

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Spring, 2010. Homework Set 4. Due Wed., May 19.

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**Please read chapter 16 of Peskin and Schroder (if you haven't already finished)) Please also read the chapter from my textbook on grand unification which I will mail to you.**

1. Work through Peskin and Schroder's treatment of renormalization by the background field method. In particular, work through the details leading to eqn. 16.102 and 16.104. Discuss the gauge fixing, in particular. Verify the structure in en. 16.122 and 16.123, and that these combine to give a result of the form 16.121. You don't need to hand in more than this, but look carefully through the details.
2. Dine, chapter 6, problem 1.
3. Dine, chapter 6, problem 2.
4. Dine, chapter 6, problem 3.