QFT

Chapter 51: Loop Corrections in Yukawa Theory

Overview

- The actual steps here have been done before, and are mimicked here. Still, let's make a general outline so that we remember all the steps.

1. Add to the Lagrangian all terms with coefficients of nonnegative mass dimension that respect the original Lagrangian's symmetries.

2. Write the exact propagator in both Lehmann-Kaellen form and as a sum of 1PI diagrams.
   - The Lehmann-Kaellen form fixes the coefficients

3. Use the usual tricks to evaluate the diagrams, simplify, and work out the renormalization factors in the MS bar or OS schemes
   - The usual tricks means Wick Rotations, Mass Dimensionality shifting, known integrals (eq. 14.27), and Feynman's Formula.

Comment

- Maybe I shouldn't have bothered with slides for part II – other than the spinors and Majorana fields, there's not much that's different.

- In this case, the remaining subtleties are fleshed out in excruciating detail with problem 51.3.