

Homework 1

Review: renormalization chapters in Srednicki, such as chapters 14 and 16 (dimensional regularization and renormalization in scalar field theory), chapter 18 (power counting and renormalizability) and chapters 27 and 28 (introduction of MS scheme and of the renormalization group). I will also discuss again the paper by Polchinski, "Renormalization and effective Lagrangians". Sections 1 and 2 are required reading, the rest of the paper is very technical and you may want to read it at some later stage of your education.

Suggested reading: Cardy chapters 1, 3 and 5; Peskin chapters 12 and 13. We will mainly follow the calculational framework and notations of Srednicki, but Peskin and especially Cardy have nice physical discussions. A classic reference (when you will have the time and energy) is the article by Wilson and Kogut, "The renormalization group and the ϵ expansion".

1. (Warm-up review problems): Srednicki problems 27.1, 28.1
2. Peskin problem 12.3 (asymptotic symmetry).
3. Cardy problem 5.6.
4. Questions abcde in Problem 1 from Silviu Pufu's lectures at the Sao Paulo bootstrap school, <http://bootstrap.ictp-saifr.org/school>