

SCPY639 Quantum Field Theory

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Topics

1. Introduction
2. Canonical quantization of scalar field
3. Field interaction and S-matrix
4. Perturbation theory and diagrammatic
5. Cross section and decay rate
6. Spinor field quantization
7. Yukawa interaction
8. Vector field quantization
9. Quantum electrodynamics or QED
10. One-loop corrections of scalar field interaction
11. Renormalization
12. One-loop corrections of QED
13. Renormalization of QED
14. Spinor-helicity amplitude method
15. Multi-loop amplitude method

References

1. Michael E. Peskin and Daniel. V. Schroeder, *An Introduction to Quantum Field Theory* (Westview Press, 1995)
2. Mathew D. Schwartz, *Quantum Field Theory and the Standard Model* (Cambridge UP, 2014)

3. Ashok Das, *Lectures on Quantum Field Theory* (WSP, 2008)
4. David Tong, *Quantum Field Theory* (Lecture Notes, 2007)
5. Timo Weigand, *Quantum Field Theory I* (Lecture Notes, 2013)