

Advanced Quantum Field Theory

1 Canonical quantization of free fields

- 1.1 Canonical quantization of the free e-m field
- 1.2 Partition function and thermodynamics Z

2 Path integrals

- 2.1 Hamiltonian formulation \hat{U} , $\langle q' | q \rangle$, S_H
- 2.2 Partition function S_H^E, S_E^E
- 2.3 Semi-classical expansion of $Z(\beta)$ Z_{class} , $\langle x \rangle$, I_p
- 2.4 Holomorphic representation $|a\rangle$, $O(a^*, a)$, $O^N(a^*, a)$, $V(a^*, t; a, t)$, \mathcal{H} , \hbar , S_H
- 2.5 Reduction formulas \hat{S} , $S(a^*, t; a, t)$, \hat{R}_0^j , ϕ_{as} , S^N , \hat{T}
- 2.6 Finite temperature results G_F , $\langle \cdot \rangle_F$, $\langle \cdot \rangle_F^c$, F_F , $(F/V)_{0,T}$

3 Functional methods

- 3.1 Generating functional for connected Green's function
- 3.2 Effective action Γ , Γ_{AB} , D_{AB} , Σ_{AB} , Φ_0^T , $\hat{\Gamma}$

4 Renormalization and asymptotic behavior