强子物理笔记

from LQCD to Hadrons

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创建于 2022 年 11 月 1 日
最新修改于 2024 年 5 月 9 日

前言

参考书目:

- *Quantum Chromodynamics on the Lattice: An Introductory Presentation* - Gattringer, Lang
- *An Introductory to Quantum Field Theory* - Peskin, Schroeder
- *Lie Algebras in Particle Physics* - Georgi

如发现任何错误或遗漏, 或希望与我讨论书中的内容, 欢迎通过邮件联系.

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Lattice QCD

The QCD Lagrangian in the continuum:

$$\mathcal{L} = \overline{\psi}(i\not{D} - m)\psi - \frac{1}{4}(F^a_{\mu\nu})^2, \tag{2.1}$$

where

$$F^a_{\mu\nu} = \partial_\mu A^a_\nu - \partial_\nu A^a_\mu + g f^{abc} A^b_\mu A^c_\nu, \tag{2.2}$$

$$D_\mu = \partial_\mu - ig A^a_\mu T^a. \tag{2.3}$$

An explicit representation of T^a:

$$T^a = \frac{\lambda_a}{2}, \tag{2.4}$$

wherein the $\lambda_a (a = 1 \ldots 8)$ are the Gell-Mann matrices.

2.1 Constructing the Euclidean Correlators