

<<标准模型动力学>>

图书基本信息

书名：<<标准模型动力学>>

13位ISBN编号：9787506292238

10位ISBN编号：7506292238

出版时间：2008-8

出版时间：世界图书出版公司

作者：（美）多诺霍 著

页数：540

版权说明：本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问：<http://www.tushu007.com>

前言

The Standard Model Lagrangian (SM) embodies our knowledge of the strong and electroweak interactions. It contains as fundamental degrees of freedom the spin one-half quarks and leptons, the spin one gauge bosons, and the spin zero Higgs fields. Symmetry plays the central role in determining its dynamical structure. The Lagrangian exhibits invariance under $SU(3)$ gauge transformations for the strong interactions and under $SU(2) \times U(1)$ gauge transformations for the electroweak interactions. Despite the presence of (all too) many input parameters, it is a mathematical construction of considerable predictive power. There are several books available which describe in detail the construction of SM and its quantization, and which deal with aspects of symmetry breaking. We felt the need for a book describing the next steps, how SM is connected to the observable physics of the real world. There are a considerable variety of techniques, of differing rigor, which are used by particle physicists to accomplish this. We present here those which have become indispensable tools. In addition, we attempt to convey the insights and 'conventional wisdom' which have been developed throughout the field. This book can only be an introduction to the riches contained in the subject, hopefully providing a foundation and a motivation for further exploration by its readers.

<<标准模型动力学>>

内容概要

This book describes the practical techniques for connecting the phenomenology of particle physics with the accepted modern theory known as the 'Standard Model'. The Standard Model of elementary particle interactions is the outstanding achievement of the past forty years of experimental and theoretical activity in particle physics. This book gives a detailed account of the Standard Model, focussing on the techniques by which the model can produce information about real observed phenomena. The text opens with a pedagogic account of the theory of the Standard Model. Introductions to the essential calculation techniques needed, including effective lagrangian techniques and path integral methods, are included. The major part of the text is concerned with the use of the Standard Model in the calculation of physical properties of particles. Rigorous and reliable methods (radiative corrections and nonperturbative techniques based on symmetries and anomalies) are emphasized, but other useful models (such as the quark and Skyrme models) are also described. The strong and electroweak interactions are not treated as independent threads, but rather are woven together into a unified phenomenological fabric. Many exercises and diagrams are included.

<<标准模型动力学>>

作者简介

John Donoghue, 美国马萨诸塞州大学物理系教授。

1976年在马萨诸塞大学获得博士学位。

主要研究领域有粒子物理学, 广义相对论, 有效场论和宇宙论。

Eugene Golowich, 美国马萨诸塞州大学物理系教授。

1965年在康乃尔大学获得理论物理博士学位。

主要研究领域是高能物理。

Barry Holstein, 美国马萨诸塞州大学物理系教授。

1969年在卡内基-梅隆大学获得博士学位。

主要研究领域是高能物理。

<<标准模型动力学>>

书籍目录

Preface Inputs to the Standard Model .1 Quarks and leptons .2 Chiral fermions The massless limit Parity, time reversal, and charge conjugation .3 Symmetries and near symmetries Noether currents Examples of Noether currents Approximate symmetry .4 Gauge symmetry Abelian case Nonabelian case Mixed case .5 On the fate of symmetries Hidden symmetry Spontaneous symmetry breaking in the sigma model Interactions of the Standard Model .1 Quantum Electrodynamics U(1) gauge symmetry QED to one loop On-shell renormalization of the electric charge Electric charge as a running coupling constant .2 Quantum Chromodynamics SU(3) gauge symmetry QCD to one loop Asymptotic freedom and renormalization group .3 Electroweak interactions Weak isospin and weak hypercharge assignments SU(2) \times U(1)_Y gauge-invariant lagrangian Spontaneous symmetry breaking Electroweak currents .4 Fermion mixing Diagonalization of mass matrices Quark mixing CP-violation and rephasing-invariants Symmetries and anomalies .1 Symmetries of the Standard Model .2 Path integrals and symmetries The generating functional Noether's theorem and path integrals .3 The U(1) axial anomaly Diagrammatic analysis Path integral analysis .4 Classical scale invariance and the trace anomaly .5 Chiral anomalies and vacuum structure The θ -vacuum The θ -term Connection with chiral rotations Introduction to effective lagrangians .1 Nonlinear lagrangians and the sigma model Representations of the sigma model Representation independence .2 Integrating out heavy fields The decoupling theorem Integrating out heavy fields at tree level .3 The low energy expansion Expansion in energy Loops Weinberg's power counting theorem .4 Symmetry breaking .5 PCAC The soft-pion theorem .6 Matrix elements of currents Matrix elements and the effective action .7 Heavy particles in effective lagrangians .8 Effective lagrangians in QED .9 Effective lagrangians as probes of new physics Leptons .1 The electron..... Very low energy QCD-pions and photons Introducing kaons and etas Kaons and the $S=1$ interaction Kaon mixing and CP violation The $N=1$ expansion Phenomenological models Baryon properties Hadron spectroscopy Weak interactions of heavy quarks The higgs boson The electroweak gauge bosons

A Appendix-Functional integration
 B Appendix-Some field theoretic methods
 C Appendix-Useful formulae
 References
 Index

<<标准模型动力学>>

章节摘录

插图：

<<标准模型动力学>>

编辑推荐

《标准模型动力学(英文影印版)》是“剑桥粒子物理、核物理和宇宙论系列丛书”中的第二本，可作为从事该领域工作的科研人员的参考资料和研究生粒子物理课程的教学用书。

<<标准模型动力学>>

版权说明

本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问:<http://www.tushu007.com>