

<<弱尺度超对称>>

图书基本信息

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内容概要

超对称是自然界中一种新的对称性。本书全面系统地介绍了粒子物理学中的超对称，首先阐述了超对称的基本概念，接着展示了如何将超对称纳入到描述基本粒子的理论框架中。书中采用了高能物理实验学家和唯象学家们所熟悉的四分量旋量表示，从而使得本书的可读性大为增强。本书迅速地将读者从抽象描述带入到构造基本粒子的超对称性规范理论，并最终给出对撞机和宇宙学实验观测量的计算。本书与高能实验和唯象理论结合得非常紧密，这是本书的一大特色。对于从事粒子物理实验和唯象研究的物理学家和研究生而言，这是一本全面、实用且易懂的教学参考书，并且包括大量的练习和补充材料，非常合适作为超对称理论的入门教材。阅读本书需要一些基本的标准模型和量子场论知识。

读者对象：粒子物理、理论物理和场论等专业的高年级本科生、研究生和相关专业的科研人员。

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章节摘录

版权页：插图： At the one—loop level, however, a coupling of $(H) u$ to down—type fermions is induced. This induced coupling leads to a new contribution, proportional to v_u , to the down—type fermion mass matrix. Although this contribution is suppressed by a loop factor relative to the tree—level contribution, this suppression is (partially) compensated if $\tan \beta$ is sufficiently large. As a result, down—type Yukawa interactions and down—type quark mass matrices are no longer diagonalized by the same transformation, and flavor—violating couplings of neutral Higgs scalars h , H , and A emerge. In the limit of large m_A , the Higgs sector becomes equivalent to the Standard Model (SM) Higgs sector with a light Higgs boson h ($\rightarrow$ HSM), and the effects of flavor violation decouple from the low energy theory. The interesting feature is that the flavor—violating couplings of h , H , and A do not decouple for large superparticle mass parameters: being dimensionless, these couplings depend only on ratios of these mass parameters, and so remain finite even for very large values of SUSY mass parameters.

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