

LATTICE FLAVORS

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Abstract

After a brief introduction to the lattice approach and to numerical calculations of hadron masses and matrix elements, many phenomenological applications to Flavour Physics are presented. Among the others, neutral meson mixing, semileptonic and radiative decays, non leptonic decays and inclusive processes will be discussed. Particular attention is devoted to systematic errors in lattice calculations.

Program of the lectures

Lattice regularization and Field Theory

1. Introduction to the lattice regularization and to Montecarlo techniques;
2. Hadron masses and simple matrix elements from Euclidean correlation functions;
3. Renormalization of lattice composite operators. The Wilson Operator Product Expansion (OPE) and its lattice version;
4. The Heavy Quark Effective Theory on the lattice. Heavy quark physics on the Lattice.
5. Systematic errors, estimates and corrections.

From Simple to Complicated

1. Light and heavy meson decay constants;
2. Neutral meson mixing in the Standard Model and beyond;
3. Semileptonic form factors and radiative decays;
4. Non-leptonic decays of light mesons, problems with the Euclidean field theory;
5. Inclusive reactions on the lattice: structure functions and the light-cone wave function for inclusive decays of heavy hadrons;
6. Miscellanea.