

High Energy Physics - Experiment

Leptonic Decays of Charged Pseudoscalar Mesons

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We review the physics of purely leptonic decays of π^{\pm} , K^{\pm} , D^{\pm} , D_s^{\pm} , and B^{\pm} pseudoscalar mesons. The measured decay rates are related to the product of the relevant weak-interaction-based CKM matrix element of the constituent quarks and a strong interaction parameter related to the overlap of the quark and anti-quark wave-functions in the meson, called the decay constant f_P . The interplay between theory and experiment is different for each particle. Theoretical predictions of f_B that are needed in the B sector can be tested by measuring f_{D^+} and $f_{D_s^+}$ in the charm sector. Currently, these tests are unsatisfactory. The lighter π and K mesons provide stringent comparisons between experiment and theory due to the accuracy of both the measurements and the theoretical predictions. An abridged version of this review was prepared for the Particle Data Group's 2010 edition.

Comments: 10 pages, 1 figure. Expanded version of a review prepared for the Particle Data Group (2010)

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