全国第十八届重味物理和 CP 破坏研讨会(HFCPV 2021)

Contribution ID: 7

Type: not specified

Global determination of two-meson distribution amplitudes from three-body B decays

We perform a global analysis of three-body charmless hadronic decays $B \rightarrow VP3 \rightarrow P1P2P3$ in the perturbative QCD (PQCD) approach, where V denotes an intermediate vector resonance, and Pi, i = 1, 2, 3, denote final-state pseudoscalar mesons. Fitting the PQCD factorization formulas at leading order in the strong coupling α s to measured branching ratios and direct CP asymmetries, we determine the Gegenbauer moments in two-meson distribution amplitudes (DAs) for the meson pairs P1P2 = $\pi\pi$, K π , KK. The fitted Gegenbauer moments are then employed to make predictions for those observables, whose data are excluded in the fit due to larger experimental uncertainties. A general consistency between our predictions and data is achieved, which

hints the validity of the PQCD formalism for the above three-body B meson decays and the universality of the

nonperturbative two-meson DAs. The obtained two-meson DAs can be applied to PQCD studies of other multibody B meson decays involving the same meson pairs. We also attempt to determine the dependence of the

Gegenbauer moments on the meson-pair invariant mass, and demonstrate that this determination is promising,

when data become more precise.

Presentation type

Oral

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