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Incorporating final-state interactions in the prediction of direct CP violation in charm-meson two-body decays

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The Kobayashi-Maskawa (KM) mechanism predicts that a single parameter must be responsible for CP-violating phenomena in different quark flavour sectors of the Standard Model (SM). Despite this minimal picture, challenged by non-SM physics, the KM mechanism has been so far verified in the bottom and strange sectors, but lacks tests in the complementary charm sector. For the sake of this, urgent theoretical progress is needed in order to provide an estimate in the SM of the recent measurement by LHCb of direct CP violation in charm-meson two-body decays, which will be significantly improved by new data expected from LHCb and Belle II. It is necessary to take into account rescattering effects for a meaningful theoretical account of the amplitudes involved in such category of observables, as signaled by the presence of large strong phases. We discuss the computation of the latter effects based on dispersion relations. We use the measured values of the branching ratios to help in selecting the non-perturbative inputs, from which we predict values for the CP asymmetries.

Consent

I consent to recording/broadcasting my presentation.

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