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Precision study of inclusive $\bar{B} \to X_d \ell^+ \ell^+$ decays

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We calculate multi-parton contributions to the inclusive $\bar{B} \to X_d \ell^+ \ell^+$ decay, which turn out to be considerable but were never considered before. We also investigate the log-enhanced QED corrections and the resonance effects induced by the up-loop amplitudes, in additional to the charm-loop ones that also appear in the b to s transition. After that, employing the other NNLO QCD, NLO QED and power corrections available in the literature, we give the Standard Model predictions of kinds of observables in $\bar{B} \to X_d \ell^+ \ell^+$, including the branching ratio, the forward-backward asymmetry and the CP asymmetry. A preliminary phenomenological update for $\bar{B} \to X_s \ell^+ \ell^+$ will also be given.

Collaboration name

Primary authors: LUNGHI, Enrico (Indiana University); Mr JENKINS, Jack; VOS, Keri (Siegen University); QIN, Qin (University of Siegen); HUBER, Tobias (Uni Siegen); HURTH, Tobias (CERN)

Presenter: QIN, Qin (University of Siegen)

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