

## On QED corrections to $\bar{B} \rightarrow \bar{K} \ell^+ \ell^-$ and $R_K$ : Theory vs Experiment (15'+3')

*vendredi 2 juin 2023 14:18 (18 minutes)*

In my talk, I will present our recent work in 2205.08635. Starting from the QED result at 1 loop for  $\bar{B} \rightarrow \bar{K} \ell^+ \ell^-$  derived in our earlier work (2009.00929), we build a dedicated Monte Carlo, which we use to cross-check PHOTOS. Next, we investigate the effect of charmonium resonances (in particular the  $J/\psi$  one) on the  $1-6 \text{ GeV}^2 q^2$ -bin used to determine  $R_K$ . Importantly, still using our Monte Carlo, we analyse the interference effects between the rare and the resonant modes, which is assumed to be negligible in the LHCb experimental analysis. Finally, we obtain semi-analytical results for the full contribution (resonant+rare) of QED corrections in  $\bar{B} \rightarrow \bar{K} \ell^+ \ell^-$ , by using a splitting function formalism which captures all large logarithms.

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