

# New LCSR B- $\rightarrow$ K Form Factors determination

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Deviations from the Standard Model have long been observed in semileptonic B-meson decays, notably  $b \rightarrow s \ell \ell$  transitions, triggering speculations on potential New Physics effects in this sector. Following recent updates of  $R_{K^{(*)}}$  and  $BR(B_{(s)} \rightarrow \gamma)$ , and the first measurement of  $R_\phi$  by the LHCb collaboration, the sole remaining significant deviations from the SM in flavour-changing neutral currents B-decays now lie in the branching ratios of decays involving  $b \rightarrow s \mu \mu$  and in the angular observable  $P_5'$ .

However, unlike  $R_{K^{(*)}}$ ,  $R_\phi$ , and  $BR(B_{(s)} \rightarrow \gamma)$ , predicting  $BR(B_s \rightarrow M)$  (with  $M = K^{(*)}, \dots$ ) is challenging due to significant non-perturbative QCD effects, which introduce up to 30% theoretical uncertainty—often comparable to experimental errors—hampering the potential of these observables for discovery.

We undertake a new calculation of local  $B \rightarrow K$  form factors using Light-Cone Sum Rules, proposing an alternative method and reassessing the systematic error associated to semi-global quark-hadron duality. These form factor predictions are then used to compute relevant observables and perform fits of NP scenarios.

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