Short- vs long-distance dynamics in b->sll decays

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The tension of $B \to K^{(*)} \bar{\ell} \ell$ decays with the Standard Model (SM) can be attributed to a short-distance (SD) $bs \bar{\ell} \ell$ interaction.

We show two methods to disentangle this effect from long-distance (LD) dynamics. Firstly, we do a comparison of the inclusive $b \to s\bar{\ell}\ell$ rate at high $q^2 = m_{\ell\ell}^2 \ge 15 \text{ GeV}^2$ with a determination based on data on the leading exclusive modes, finding a $\sim 2\sigma$ discrepancy. Secondly, we do a data-driven analysis of the exclusive $B \to K^{(*)}\bar{\ell}\ell$ spectrum in the entire q^2 region. With a dispersive parametrization of the charmonia resonances, we extract the non-SM contribution to the Wilson coefficient C_9 for every bin in q^2 . The result is compatible with the SD hypothesis and the inclusive determination. Finally, with the aim of having a better control over LD effects that mimic the C_9 contribution, we give an estimate of the size of charm-rescattering processes in $B \to K\bar{\ell}\ell$.

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Author:TINARI, AriannaPresenter:TINARI, AriannaSession Classification:Quark and Lepton Flavour Physics

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