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## New tests of short-distance dynamics in $b \rightarrow s\bar{\ell}\ell$ decays

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The rare  $B \rightarrow K^{(*)}\bar{\ell}\ell$  decays exhibit a long-standing tension with Standard Model (SM) predictions, which can be attributed to a lepton-universal short-distance  $b \rightarrow s\bar{\ell}\ell$  interaction.

We present two novel methods to disentangle this effect from long-distance dynamics: one based on the determination of the inclusive  $b \rightarrow s\bar{\ell}\ell$  rate at high dilepton invariant mass ( $q^2 \geq 15 \text{ GeV}^2$ ), the other based on the analysis of the  $q^2$  spectrum of the exclusive mode  $B \rightarrow K\bar{\ell}\ell$  (in the entire  $q^2$  range).

Using the first method, we show that the SM prediction for the inclusive  $b \rightarrow s\bar{\ell}\ell$  rate at high dilepton invariant mass is in good agreement with the result obtained summing the SM predictions for one- and two-body modes ( $K, K^*, K\pi$ ). This observation allows us to perform a direct comparison of the inclusive  $b \rightarrow s\bar{\ell}\ell$  rate with data. This comparison shows a significant deficit ( $\sim 2\sigma$ ) in the data, fully compatible with the deficit observed at low- $q^2$  on the exclusive modes. This provides independent evidence of an anomalous  $b \rightarrow s\bar{\ell}\ell$  short-distance interaction, free from uncertainties on the hadronic form factors.

To test the short-distance nature of this effect we use a second method, where we analyze the exclusive  $B \rightarrow K\bar{\ell}\ell$  differential branching ratio data in the entire  $q^2$  region. Here, after using a dispersive parametrization of the narrow charmonia resonances, we extract the non-SM contribution to the universal Wilson coefficient  $C_9$  for every bin in  $q^2$ . The  $q^2$ -independence of the result, and its compatibility with the inclusive determination, provide a consistency check of the short-distance nature of this effect.

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