

# $B$ meson anomalies and large $B^+ \rightarrow K^+ \nu \bar{\nu}$ in non-universal $U(1)'$ models

*Sunday, 2 June 2024 11:45 (25 minutes)*

In view of both the latest LHCb measurement of  $R_{K^{(*)}}$  and the new  $2.7\sigma$  deviation reported by Belle II on  $B^+ \rightarrow K^+ \nu \bar{\nu}$  decays, we present a fit to the  $B$  meson anomalies for various one and two dimensional hypothesis including complex Wilson coefficients. We show in a model-independent way that the generic non-universal  $U(1)'$  extensions of the SM, without flavour violation, fail to simultaneously fit those observables and corroborate that they can modify  $\text{BR}(B^+ \rightarrow K^+ \nu \bar{\nu})$  up to only a 10%. In view of this deficit, we propose a new way in which those models can accommodate the data at tree level by introducing lepton flavour violating couplings and non-diagonal elements of the charged lepton mixing matrix, with implications in future charged lepton flavour violation searches.

## Paper info

JHEP 02 (2024) 121 • e-Print: 2308.13426 [hep-ph]

**Primary author:** SIERRA FONSECA, CRISTIAN FELIPE (Nanjing Normal University)

**Co-authors:** ATHRON, Peter (Nanjing Normal University); Prof. MARTINEZ, Roberto (National University of Colombia)

**Presenter:** SIERRA FONSECA, CRISTIAN FELIPE (Nanjing Normal University)

**Session Classification:** Flavor