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Probing B-Anomalies via Dimuon Tails at a Future Collider

Tuesday 10 May 2022 16:45 (15 minutes)

In this talk we investigate the sensitivity of future proton-proton colliders to a contact interaction of the form $1/\Lambda^2(\bar{b}_L\gamma_\mu s_L)(\bar{\mu}_L\gamma^\mu\mu_L)$ as indicated by the long-standing rare B-decay anomalies. We include NLO QCD and electroweak effects and employ an optimized binning scheme, and carefully validate our background calculation against ATLAS and CMS data.We find that the FCC-hh with $40\,\text{ab}^{-1}$ of luminosity is able to exclude scales Λ up to 26 TeV at 95% CL, and discover Λ up to 20 TeV. While this is not quite enough to exclude or discover the current best-fit value of 39 TeV, this can in principle be achieved with more luminosity and/or higher energy, as we study quantitatively. Our analysis is conservative in that it assumes only a $\bar{b}s\mu\mu$ contact interaction.

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