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Lepton universality tests with dineutrino modes

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$SU(2)_L$ -invariance links charged dilepton $\bar{q}q'\bar{\ell}\ell$ and dineutrino $\bar{q}q'\bar{\nu}\nu$ couplings.

This connection can be established using SMEFT and holds model-independently if only SM-like left-handed light neutrinos are present. This allows to perform complementary experimental tests of lepton universality and charged lepton flavour conservation with flavour-summed dineutrino observables.

It was recently shown in arXiv:2010.02225 that rare $|\Delta c| = |\Delta u| = 1$ dineutrino transitions constitute excellent null tests of the SM and signals of new physics can be just around the corner.

In this talk we present the phenomenological implications of this interplay between dineutrino and dilepton modes in different flavour systems, including charm and B -physics, and provide predictions for i) universality and ii) for charged lepton flavour conservation that can be tested at e^+e^- -machines including Belle II.

arXiv number (if applicable)

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