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## Exploring Lepton-Flavor Violation in Higgs Decays via an Ultralight Gauge Boson

Friday 6 December 2024 10:50 (25 minutes)

In this work, we explore the potential of lepton-flavor violating (LFV) Higgs decays as a probe for new physics, specifically through the mediation of an ultralight gauge boson, denoted as  $\chi$ . Our study bridges the gap between a model generating the LFV interaction  $\bar{\ell}_i \ell_j \chi$  at tree level and an effective field theory framework that preserves the light mass of  $\chi$ . We utilize stringent constraints from recent CMS and ATLAS data on  $H \rightarrow \ell_i \ell_j$  decays to infer an upper bound on the exotic decay channel  $H \rightarrow \ell_i \ell_j \chi$ . The talk will delve into various kinematic observables, including the lepton energy spectrum, Dalitz plot distribution, and asymmetries in lepton charge and forward-backward distributions, offering a comprehensive perspective on the implications of our findings.

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