Contribution ID: **144** Type: **not specified**

What if cLFV was only manifest in tau decays?

Tuesday 9 May 2023 15:30 (15 minutes)

Motivated by flavour symmetry models, one may construct theories based on a low-energy limit featuring lepton flavour triality that have the flavour-violating decays $\tau^{\pm} \to \mu^{\pm}\mu^{\pm}e^{\mp}$ and $\tau^{\pm} \to e^{\pm}e^{\pm}\mu^{\mp}$ as the main phenomenological signatures of BSM physics. These decay modes are expected to be probed in the near future with increased sensitivity by the Belle II experiment at the SuperKEKB collider. I will discuss the motivation, model-building and phenomenology of simple extensions to the SM featuring doubly-charged scalars, for which the smoking-gun would be a detection of cLFV in these tau decay channels.

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Session Classification: BSM VII

Track Classification: BSM