Contribution ID: **60** Type: **Poster**

Improved Limits on Lepton-Flavor-Violating Decays of Light Pseudoscalars via Spin-Dependent $\mu \to e$ Conversion in Nuclei

Lepton-flavor-violating decays of light pseudoscalars, $P = \pi^0, \eta, \eta' \to \mu e$, are stringently suppressed in the Standard Model up to tiny contributions from neutrino oscillations, so that their observation would be a clear indication for physics beyond the Standard Model.
However, in effective field theory such decays proceed via axial-vector, pseudoscalar, or gluonic operators, which are, at the same time, probed in spin-dependent $\mu \to e$ conversion in nuclei.
We derive master formulae that connect both processes in a model-independent way in terms of Wilson coefficients, which in the case of $\mu \to e$ conversion in nuclei requires input for the nuclear matrix elements including the charge density to account for the bound-state physics, and study the implications of current μ ⟶ e limits in titanium for the P ⟶ μe decays. We find that these indirect limits surpass direct ones by many orders of magnitude.

based on: Phys.Rev.Lett. 130 (2023) 13, 131902

Primary authors: Prof. HOFERICHTER, Martin (University of Bern); MENÉNDEZ, Javier (University of Barcelona); NOËL, Frederic (ITP, AEC, Uni Bern)

Presenter: NOËL, Frederic (ITP, AEC, Uni Bern)

Session Classification: Poster session