Contribution ID: **62** Type: **Flash Plenary Talk**

Muon-decay parameters at COHERENT

Thursday, 29 May 2025 14:30 (8 minutes)

We study the most general Lagrangian for muon decay at low energies, including light Dirac right-handed neutrinos (νWEFT), in the COHERENT experiment at the Spallation Neutron Source at Oak Ridge National Laboratory. Using the COHERENT data, we derive the first direct constraint on the Michel parameters governing the $\bar{\nu}_\mu$ energy distribution. We also discuss future sensitivities and assess the implications for the Lorentz structure of the interactions mediating muon decay.
We thus demonstrate that Coherent Elastic Neutrino-Nucleus Scattering (CEνNS) measurements at spallation sources are valuable probes of muon decay physics.

Muon dipole moments (magnetic and electric): theory, experiments and future perspectives

Charged lepton flavor violation: theory, experiment and future perspectives

New Physics opportunities with low and high energy muon beams

Neutrino physics with muon beams: theory, experiments and future perspectives

none

Muons beams technologies: production, cooling and acceleration at different energy

Advancements in Muon-based Facilities and Broader Applications

Muons in other fields: muography, muon spin spectroscopy, muon-catalyzed fusion

Primary author: DE LA CRUZ ALZAGA, Sergio (IFIC (CSIC-Universidad de Valencia))

Co-authors: GONZALEZ-ALONSO, Martin (IFIC (UV & CSIC)); Dr PRAKASH, Suraj (IFIC (CSIC-Universidad de Valencia)); BRESÓ PLA, Víctor (University of Heidelberg)

Presenter: DE LA CRUZ ALZAGA, Sergio (IFIC (CSIC-Universidad de Valencia))

Session Classification: New Physics oppportunities with low and high energy muon beams