## International Workshop on Muon Physics at the Intensity and Precision Frontiers (MIP2025)



Contribution ID: 75

Type: not specified

## Predicting and Discovering True Muonium $(\mu^+\mu^-)$

The observation of discrepancies in the muonic sector motivates searches for the yet undiscovered atom-like true muonium state  $(\mu + \mu^{-})$ , i.e., the bound state of muon and anti-muon pair. In this talk, I will present one possible way of discovering the true muonium from the decay of the  $K_L$  meson via the rare  $K_L$  decay searches at J-PARC and CERN. I will also discuss analytical results for hyperfine splitting of the true muonium induced by the e and  $\tau$  loops at  $O(m_{\mu}\alpha^6)$ . This theoretical result can help us better understand the muon couplings from future potential experimental data.

Primary authors: Dr LAMM, Henry (Fermilab); JI, Yao Presenter: JI, Yao