

Neutron Lifetime Puzzle



Contribution ID: 5

Type: **invited**

The NIST Beam Neutron Lifetime Experiments

Saturday 13 September 2025 11:10 (45 minutes)

A series of neutron lifetime measurements using the beam method has been conducted at the National Institute of Standards and Technology (USA) for more than 30 years. In these experiments, a cold neutron beam passes through a quasi-Penning trap where protons from free neutron decay are captured and subsequently counted by a silicon detector. We will review the previous BL1 experiment (2005, 2013); discuss the current BL2 experiment and systematic issues we have focused on, in particular proton charge exchange with residual gas in the trap; and describe BL3, a new next-generation version of the experiment with improved systematics and capable of a high precision result at the <0.3 s level.

Author: WIETFELDT, Fred (Tulane University)

Presenter: WIETFELDT, Fred (Tulane University)

Session Classification: Recent Advances in Neutron Lifetime Measurements