Contribution ID: **22** Type: **not specified**

The Search for Long-Lived Particles: Construction of MATHUSLA Detector Test Stand

Monday, August 19, 2024 11:30 AM (10 minutes)

Many current theories about physics beyond the Standard Model predict the existence of long-lived particles (LLPs) that could be produced by the LHC. As they decay a macroscopic distance away from their production point, the ability of currently installed detectors to identify neutral LLPs is limited. The proposed MATHUSLA experiment, once installed above the CMS detector, would use layers of plastic scintillator bars coupled by wavelength-shifting fibers to silicon photomultipliers to reconstruct the decays of neutral LLPs within its detector volume. At the University of Toronto, we assembled a test stand to investigate practical considerations and feasibility of the design, and we are able to reconstruct the paths of cosmic ray muons passing through the stand's layers. In this presentation, I will discuss the different factors which affect the precision and efficiency of our test stand, and what design choices we made to meet our requirements.

What area of study best describes your talk?

Engineering

If you answered 'Other', please provide the study area.

Primary author: LAU, Alex

Presenter: LAU, Alex

Session Classification: Presentations