

## New Perspectives



Contribution ID: 61

Type: **not specified**

# Searching for dark sector particles in the SpinQuest experiment

*Thursday, June 16, 2022 1:30 PM (15 minutes)*

Searching for light and weakly-coupled dark sector particles is of vital importance in worldwide dark matter searches. Long-lived dark mediators can be generated through interactions between proton beam and fixed target at the SpinQuest experiment (E1039) at Fermilab. These hypothetical long-lived particles will travel several meters before decaying into SM particles and can be tracked by the dedicated spectrometer. A new dimuon trigger system is under development to improve the efficiency for displaced signals. We also propose a further upgrade by adding an electromagnetic calorimeter to the current detector to extend the detection capability to electron, photon, and hadronic final states. With these dedicated effort, we can perform new world-leading searches within the next few years.

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**Session Classification:** Fixed Target