Contribution ID: **41** Type: **not specified**

# Prospects for Dark Sector Search at the Deep Underground Neutrino Experiment

*Tuesday, May 24, 2022 3:50 PM (23 minutes)*

Dark matter is known to make up more than 75% of matters of the universe. However, its nature remains to be unveiled. Over the several decades, extensive studies have been done on the weak scale mass regime, but there have been no positive results thus far. This naturally led to an interest in the dark matter models in areas other than the weak scale.

The Deep Underground Neutrino Experiment (DUNE) is an international collaboration that aims at a variety of physics topics, while its primary scientific goal is a precision measurement of neutrino oscillation parameters. The high-intensity proton beams and precision detector system are essential to the design goals for this project. These provide ample opportunities for the potential discoveries of new particles, new interactions, and symmetries beyond the Standard Model (BSM). The beam power is expected to be 1.2 MW corresponding to protons-on-target of 1.1×1021/year, upgradable to multi-megawatt power. The Near Detector (ND) complex will be located 574 m away from the neutrino production target. The ND complex consists of a liquid argon time projection chamber (TPC), a magnetized gaseous argon TPC, and a large, magnetized beam monitor. This environment provides excellent conditions to probe many BSM physics topics.

This presentation will discuss the dark sector search program at DUNE, specifically light dark matter and axion-like particles. I will introduce their physics motivation, production mechanisms, the current status of the study, and its prospects.

**Author:** JANG, Wooyoung (University of Texas at Arlington)

**Presenter:** JANG, Wooyoung (University of Texas at Arlington)

**Session Classification:** Electroweak