

DAMSA: A Novel Dark Sector Particle Search Experiment at Fermilab PIP-II and Beyond

Tuesday, June 27, 2023 5:00 PM (15 minutes)

The search for dark sector particles has been a subject of significant interest in particle physics due to its potential to explain several long-standing mysteries in the universe. In this presentation, I will discuss a novel beam dump experiment concept called Dump-produced Aboriginal Matter Searches at an Accelerator (DAMSA), a pioneering experimental challenge designed to overcome beam-induced neutron background and tackle the dark sector particle searches at high-intensity proton accelerator facilities, such as Fermilab's PIP-II and beyond. DAMSA experiment utilizes the high intensity proton beam from accelerator, a tungsten (W) beam dump and the neutron absorber surrounding the dump, followed by a decay chamber, and a total absorption electromagnetic calorimeter (ECAL) with high precision spatial and temporal resolution. Based on our benchmark physics study, searching for axion-like particle (ALP), I will discuss the overall key points of the experiment and the expected sensitivity reach at a PIP-II LINAC beam dump.

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