

DarkQuest and LongQuest at the 120~GeV Fermilab Main Injector

Expanding the mass range and techniques by which we search for dark matter is an important part of the worldwide particle physics program which has been specifically emphasized in the DOE Basic Research Needs for Dark Matter New Initiatives report. Accelerator-based searches for dark matter are a uniquely compelling part of this program as a way to both create and detect dark matter in the laboratory and explore the dark sector by searching for mediators and excited dark matter particles. Our proposal focuses on developing the DarkQuest experimental concept and related enhancements collectively referred to as LongQuest. DarkQuest is a proton fixed-target experiment with particular sensitivity to an array of visible dark sector signatures in the MeV-GeV mass range. Because it builds off of existing accelerator and detector infrastructure, it offers a powerful but low-cost experimental initiative that can be realized on a short timescale.

Primary frontier topic

Rare Processes and Precision Measurements Frontier

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