

A proposed PKU-Muon experiment for muon tomography and dark matter search

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Exotic dark matters may exist which are either muon-philic or slowed down due to some mechanism. We propose here a set of new methods to directly detect these dark matter through its scattering with abundant atmospheric muons or accelerator beams. Firstly, we plan to use the free cosmic-ray muons interacting with dark matter in a volume surrounded by tracking detectors, to trace possible interaction between dark matter and muons. Secondly, we will interface our device with domestic or international muon beams. Due to much larger muon intensity and focused beam, we anticipate the detector can be made further compact and the resulting sensitivity on dark matter searches will be improved. In line with above projects, we will develop muon tomography methods and apply them on atmospheric and environmental sciences, archaeology and civil engineering. Furthermore, we will measure precisely directional distributions of cosmic-ray muons, either at mountain or sea level, and the differences may reveal possible information of dark matter distributed near the earth. In the future, we may also extend our study to muon on target experiments.

Collaboration (if any)

Primary author: LI, Qiang (Peking University)

Presenter: LI, Qiang (Peking University)

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