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The SHADOWS Experiment

SHADOWS (*Search for Hidden and Dark Objects With the SPS*) is a proposed new beam-dump experiment, whose purpose is to search for a large variety of feebly-interacting particles possibly produced in the interactions of a 400 GeV proton beam with a dense target. SHADOWS has the potential to discover FIPs if they have a mass between the Kaon and the Beauty mass.

FIPs can emerge from the decays of charm and beauty hadrons with a non-negligible transverse momentum and can be detected by an experiment placed off-axis where it is less affected by the beam background. Therefore SHADOWS can be placed at a beam of the CERN SPS and operated concurrently to the NA62 experiment, when NA62 is operated in beam-dump mode.

This contribution describes the state of the art of the detectors of the SHADOWS experiment.

The detector is a spectrometer placed after a long decay volume where FIPs can decay to two (or more) charged tracks or photons. The spectrometer will consist of a tracking system with high accuracy on the mass and decay vertex reconstruction, electromagnetic and hadronic calorimeters, and muon detector and timing detector with excellent time resolution (~ 100 – 200 ps) in order to reduce any combinatorial background (in particular the muon one) by requiring the tracks to be coincident in time.

Primary experiment

SHADOWS

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Track Classification: Dark matter and other low-background experiments