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Status of the NA64mu experiment

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NA64 is a fixed target experiment searching for Dark Sectors with the missing energy/momentum technique by employing high energy electron, positron, muon and hadron beams at the CERN Super Proton Synchrotron accelerator. In this talk, we focus on the status of the program using the high intensity M2 muon beamline. The first results obtained with 1.98×10^{10} muons on target (MOT) collected in 2022 demonstrated the feasibility of the technique and were published in Phys. Rev. Lett. 132, 211803 (2024) and Phys Rev. D 110, 112015 (2024). In 2023 and 2024, the experimental setup was significantly improved allowing us to double the beam intensity, further background suppression, and accumulating 10 times more data with $\sim 3.5 \times 10^{11}$ MOT in total. In this talk, I will report the status of the ongoing 2023 data analysis and the experiment prospects in probing the parameter space of the well-motivated benchmark Light Dark Matter models and other scenarios of New Physics below the electroweak scale.

Abstract

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