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The MoEDAL-MAPP Facility at the LHC –Status Report

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Phase-0 of the MoEDAL-MAPP Facility began with installing the MoEDAL detector at IP8 on the LHC ring in 2010. In 2021, as part of Phase-1, CERN approved MoEDAL's reinstallation for Run-3 with key upgrades: a tenfold lower detection threshold, a fivefold luminosity increase, and a center-of-mass energy boost from 13 TeV to 13.6 TeV. MoEDAL will continue searching for highly ionizing particles (HIPs) predicted by beyond the Standard Model (BSM) theories such as, enhanced SM models, supersymmetry, neutrino mass models, and left-right symmetry. Also, in Phase-1, the MoEDAL Apparatus for Penetrating Particles (MAPP-1) was installed in the UA83 tunnel, 100 meters from IP8, and will begin data collection in 2025. MAPP-1 can detect feebly ionizing particles with charge or effective charge as low as $0.001e$. The MAPP-1 Outtrigger, designed to enhance MAPP-2's sensitivity to fractionally charged particles such as millicharged particles ($> 0.01e$), is awaiting approval and is expected to take data in 2026. MAPP-1 and the Outtrigger also have some sensitivity to neutral long-lived particles (LLPs). In Phase-2, the MAPP-2 upgrade is planned for the HL-LHC and will be installed in the UGC1 gallery near IP8, radically improving MoEDAL-MAPP's ability to detect neutral LLPs decaying into charged particles and photons

Secondary track

T02 - Dark Matter

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