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MoEDAL-MAPP and the lifetime frontier

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The unprecedented collision energy of the LHC has opened up a new discovery regime. The first LHC dedicated search experiment, MoEDAL, has inaugurated the lifetime frontier being optimised for searches of long-lived particles. MoEDAL is designed to search highly ionising particle avatars of new physics using proton and heavy-ion collisions at the LHC. The upgrade for MoEDAL at Run 3 - the MAPP detector (MoEDAL Apparatus for Penetrating Particles) - will extend the physics reach to include feebly interacting, long-lived messengers of physics beyond the Standard Model. This will allow us to explore a number of models of new physics, including dark sector models, in a complementary way to that of the main LHC detectors. The presentation will focus on recently published results and plans for the Run 3 and HL-LHC.

B Acharya et al [MoEDAL Collaboration], “MoEDAL search in the CMS beam pipe for magnetic monopoles produced via the Schwinger effect,”
Phys.Rev.Lett. 133 (2024) 071803
→ Editors’ Suggestion

B Acharya et al [MoEDAL Collaboration], “Search for highly ionizing particles in pp collisions during LHC Run-2 using the full MoEDAL detector,”
Phys.Rev.Lett., to appear[\arXiv:2311.06509 [hep-ex]]

M Kalliokoski, V A Mitsou, M de Montigny, A Mukhopadhyay, P-P A Ouimet, J Pinfold, A Shaa, M Staelens, “Searching for Minicharged Particles at the Energy Frontier with the MoEDAL-MAPP Experiment at the LHC,”
JHEP 04 (2024) 137

Author: Dr MITSOU, Vasiliki (IFIC - CSIC and Univ. of Valencia (ES))

Presenter: Dr MITSOU, Vasiliki (IFIC - CSIC and Univ. of Valencia (ES))

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