HECA Seminar
(High Energy, Cosmology and Astro-particle physics)
HECA web-page

Tuesday 1.06.2021, h 11:15
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Rafał Masełek

University of Warsaw

Detecting long-lived multi-charged particles in neutrino mass models with MoEDAL

Abstract

Monopole and Exotics Detector at the LHC (MoEDAL) is a mostly passive detector located in the LHCb cavern, just outside LHCb detector. MoEDAL was designed to search for magnetic monopoles, but it also sensitive to long-lived charged particles.

A certain class of neutrino mass models predicts long-lived particles whose electric charge is four or three times larger than that of protons. Such particles, if they are light enough, may be produced at the LHC and detected. We investigate the possibility of observing those long-lived multi-charged particles with the MoEDAL detector.

To demonstrate the performance of MoEDAL on multi-charged long-lived particles, two concrete neutrino mass models are studied. In the first model, the new physics sector is non-coloured and contains long-lived particles with electric charges 2, 3 and 4. The second model has a coloured new physics sector, which possesses long-lived particles with electric charges 4/3, 7/3 and 10/3. We explore the parameter space of these models and identify the regions that can be probed with MoEDAL at the end of Run-3 and the High-Luminosity LHC.

Best regards,

Andrzej Hryczuk
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Kazuki Sakurai
Enrico Maria Sessolo
Krzysztof Turzyński