

# Phenomenology 2020 Symposium



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## Millicharged Dark Sectors at FerMINI, Neutrino Experiments, and Neutrino Observatories

Monday 4 May 2020 17:15 (15 minutes)

Millicharged particles (MCPs) are linked to the fundamental questions like charge quantization, and can make up a fraction of the DM abundance. The recent surge of interest of MCPs is linked to the EDGES anomaly, the excesses seen in direct-detection experiments, and the study of strongly interacting dark matter (SIDM).

In this talk, I will present the searches of MCP and millicharged SIDM in fixed target facilities and neutrino observatories.

MCPs can be produced from intense proton beams hitting the target, or from cosmic-ray hitting the earth's upper atmosphere. The MCPs produced can be detected by the detectors downstream of the fixed-target facility or by large neutrino observatories located underground. I will discuss the constraints and sensitivity reaches of these probes. Finally, I will introduce a specialized fixed-target scintillation experiment, FerMINI, that could provide the best sensitivity reach of MCP and millicharged SIDM in the MeV to GeV regime.

This talk is mainly based on

- <https://arxiv.org/abs/1812.03998>

- <https://arxiv.org/abs/1806.03310>

- <https://arxiv.org/abs/2002.11732>

(see [https://arxiv.org/a/tsai\\_y\\_1.html](https://arxiv.org/a/tsai_y_1.html) for more refs.)

### Summary

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**Session Classification:** DM II

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