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SoLAr detector small scale prototype

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The LArTPC technology, in the last decade has witnessed several novelties, preparing the stage for the next generation of large scale long baseline neutrino experiments such as DUNE.

The SoLAr detector concept aims to extend the sensitivities of such detectors to the MeV energy range, and expands their physics reach to precision measurement of solar and supernovae neutrinos.

The core concept is centered around an integrated charge-light readout plane, consisting of pixel pads for charge collection and VUV SiPMs for direct detection of LAr scintillation light. The main challenges are to achieve low energy thresholds with an excellent energy resolution and successfully perform background rejection using pulse shape discrimination.

A staged prototyping program is planned to demonstrate the technology viability of the detector concept step by step. In October 2022, a small scale SoLAr prototype was constructed and tested in LAr at Bern University. Here we present the results from the first prototype run with cosmic muons and discuss the roadmap to a ton scale demonstrator at Boulby Underground Laboratory.

Primary author: PARSA, Saba (University of Bern)

Presenter: PARSA, Saba (University of Bern)

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