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Low-energy calibration of DUNE prototypes at CERN with Michel electron energy reconstruction

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DUNE is a neutrino oscillation experiment expected to take its first data around 2030. A near and a far measurement of an accelerator-produced muon neutrino flux allows for a precise determination of the oscillation parameters, including a first measurement of δ_{CP} (CP violation parameter). The far detector is a compound of tens of kiloton liquid argon time projection chambers (LArTPC). Two reduced-size prototypes are operated at CERN. Aside from beam neutrino measurements, the far detector might be sensitive to supernova neutrinos, typically around 10 MeV. The prototypes allow to study the sensitivity to such a signal of the LArTPC technology at large scale. Cosmic muons, abundant at ground level where the prototypes are located, mainly decay to 0-50 MeV electrons (Michel electrons) are an ideal calibration source at the energy range of supernova neutrinos.

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