

What Physics Can We Learn about in SBND from its "Prehistoric Era"?

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The Short-Baseline Near Detector (SBND) is a 100-ton scale Liquid Argon Time Projection Chamber (LArTPC) neutrino detector positioned in the Booster Neutrino Beam (BNB) at Fermilab. SBND is an on-surface detector, and will therefore be surrounded by an external cubical sub-detector, the Cosmic Ray Tagger (CRT) system, which is designed to reduce the cosmic ray background. The CRT system employs plastic scintillation coupled with silicon photo-multipliers (SiPMs) to detect photons emitted when charged particles from cosmic rays deposit energy. The CRT system is the first SBND subsystem to have entered the installation and commissioning stage. One of goals for the commissioning is to understand the SiPM response to individual photo-electrons. In the past, SBND has taken data using the bottom layer of the CRT system, which was installed in the detector hall from 2017 to 2019. This data was used to test the CRT performance, but it is also very useful to validate our simulation with this real physics data. In this talk, I will present a part of results of CRT commissioning and preliminary data-to-MC comparisons with data taken from 2017 to 2019.

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