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Vetoing charged particles for neutrino detection at the LHC

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The SND@LHC detector is a compact and standalone experiment to perform measurements with neutrinos produced at the LHC in an unexplored pseudo-rapidity region of 7.2 < 𝜂 < 8.6, complementary to all the other experiments at the LHC. The detector is a hybrid system based on an 800 kg target mass of tungsten plates, interleaved with emulsion and electronic trackers complemented with a veto system, a calorimeter and a muon system.

Efficient tagging of incoming charged particles is of the utmost importance to identify interactions of neutrinos, or feebly interacting particles, in the detector volume. On data collected in 2022, the veto inefficiency, although at the 10E(-7) level, had to be reinforced by using the first two planes of the electronic tracking detector in order to achieve a veto inefficiency suitable for rejecting all the muon background. Consequently, the collaboration decided to enhance the two-plane veto system with a third layer of scintillating bars, before the resumption of LHC operations in 2024.

This presentation will detail the construction and commissioning of the third veto plane. The efficiency has been evaluated using cosmic rays and validated with data obtained from pp collisions after installation. The talk will also cover the performance and improvements compared to the previous setup.

Collaboration

SND@LHC

Role of Submitter

The presenter will be selected later by the Collaboration

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