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Neutrino Physics with the SND@LHC Experiment

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The SND@LHC experiment was designed to perform measurements with neutrinos produced at the LHC within the unexplored pseudo-rapidity range of 7.2 < ⍰ < 8.6. Located 480 m downstream of IP1 in the unused TI18 tunnel, this compact and stand-alone experiment employs a hybrid detector system consisting of 800 kg of tungsten plates interleaved with emulsion and electronic trackers, complemented by a calorimeter and a muon detection system. This configuration allows for the efficient identification of all three neutrino flavors, thereby opening new
opening a unique opportunity to probe the physics of heavy flavour production at the LHC, particularly in regions inaccessible to existing experiments such as ATLAS, CMS, and LHCb.
Exploring this region is also crucial for future circular colliders and predictions of very high-energy atmospheric neutrinos. Furthermore, the detector's design is adept at searching for Feebly Interacting Particles through distinctive scattering signatures. Since its initiation in 2022, the SND@LHC experiment has successfully operated during LHC Run 3 and collected 290 fb−1 of data. This presentation will summarize the results obtained thus far, the methodologies employed, and the implications for advancing our understanding of neutrino physics.

Collaboration you are representing

SND@LHC

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