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SND at the LHC

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The scattering and neutrino detector (SND) at the LHC will measure for the first time neutrino properties from $pp \to \nu X$ and search for Dark Matter in an unexplored energy and pseudo-rapidity range. It will be located in the TI18 tunnel, which is ideal due to the low environmental and machine-induced background. The detector will measure the neutrino energy and identify all three neutrino species in an unprecedented energy domain (between 350 GeV and few TeV). The experiment will be off-axis and cover a pseudo-rapidity range from $7.2 < \eta < 8.8$, meaning the incoming neutrinos stem mainly from charm decays. It will comprise a nuclear emulsion target interleaved with a scintillating fibre tracker, a timing detector with a resolution less than 50 ps, and a downstream muon identification system. An upstream veto timing detector will filter out charged particles. The neutrino flavour will be identified by the charged lepton at the primary vertex: electrons and taus will be identified within the emulsion while the muons will be identified in the muon detector. Dark Matter will be identified by its nuclear recoil within the emulsion material. The energy of incident particles will be reconstructed by measuring the energy of electrons and hadrons in a calorimetric way with scintillator fibre planes.

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