

Construction and Commissioning of the SND@LHC Detector

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- SND@LHC is a compact experiment being installed to unprecedentedly explore LHC neutrinos of all three flavours from pp interactions in the pseudo-rapidity range $7.2 < \eta < 8.6$ in LHC run-3.
- Neutrino energies from 100 GeV to the TeV scale.
- Neutrinos originating from charmed hadrons, probes feebly interacting particles.
- Located in T118, 480m downstream of the ATLAS IP1.

Detector Design

Veto System

- To veto interactions by charged particles.
- Technology shared with Muon System.
- Two planes of scintillating bars covering the target region.

Vertex Detector

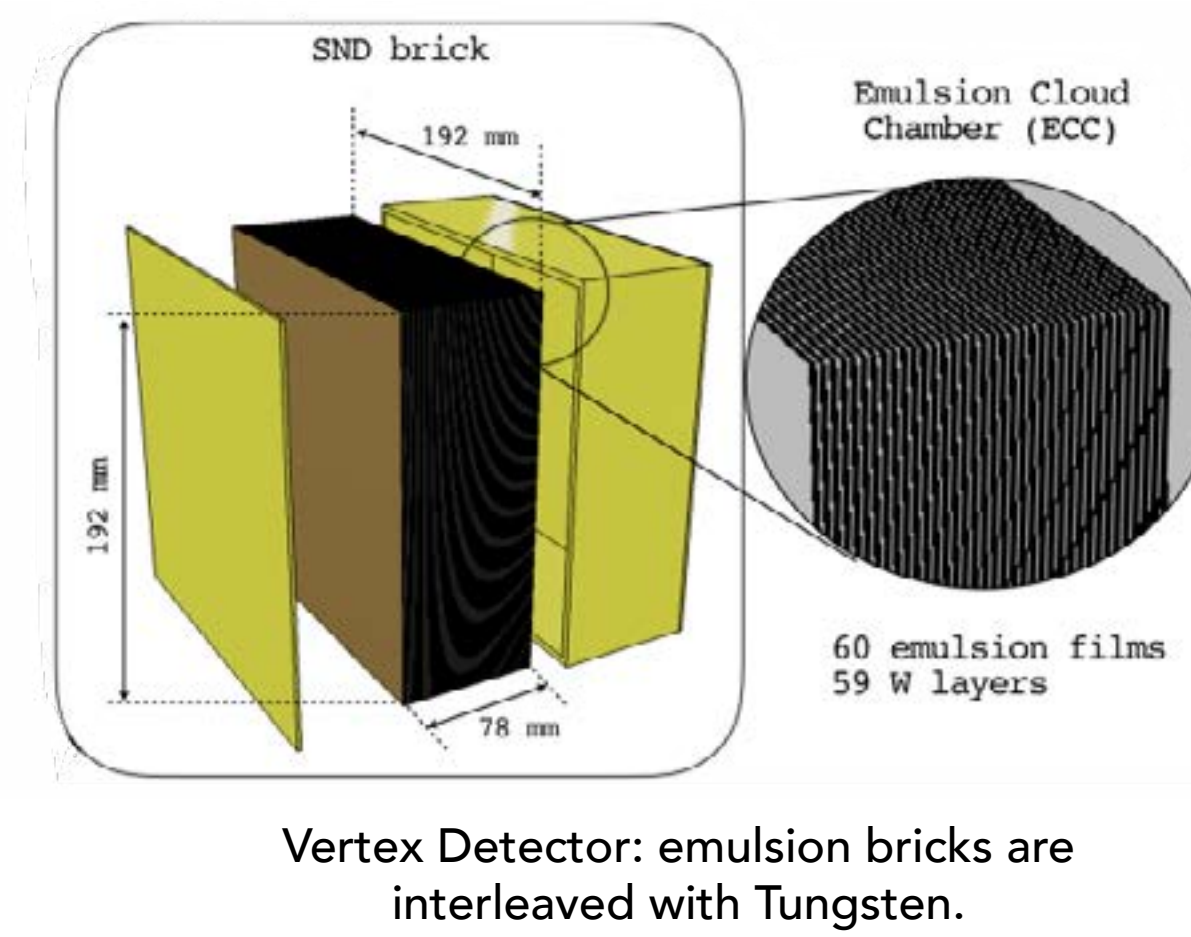
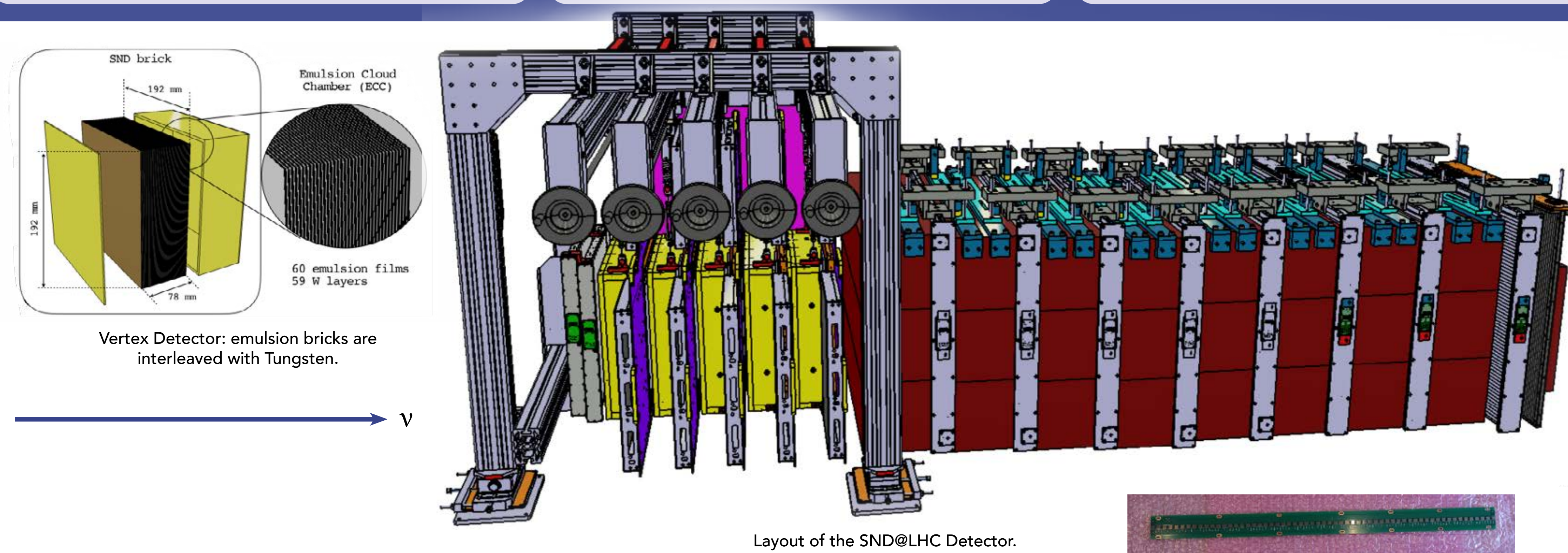
- Five emulsion chambers interleaved with passive Tungsten absorber layers.
- Sub-micrometric position and milliradian angular resolution. Resolves tau production and decay vertices.

Target Tracker and ECAL

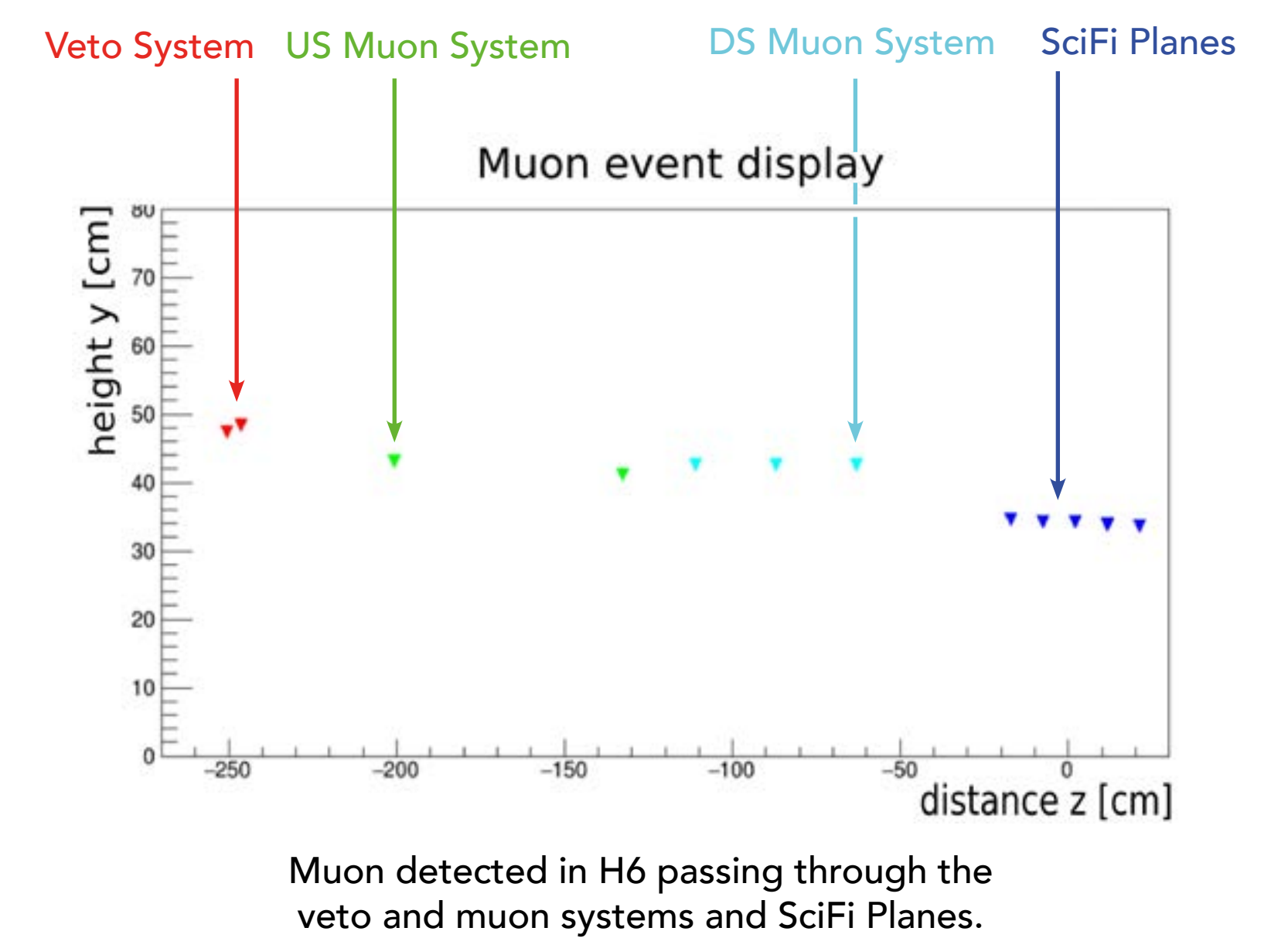
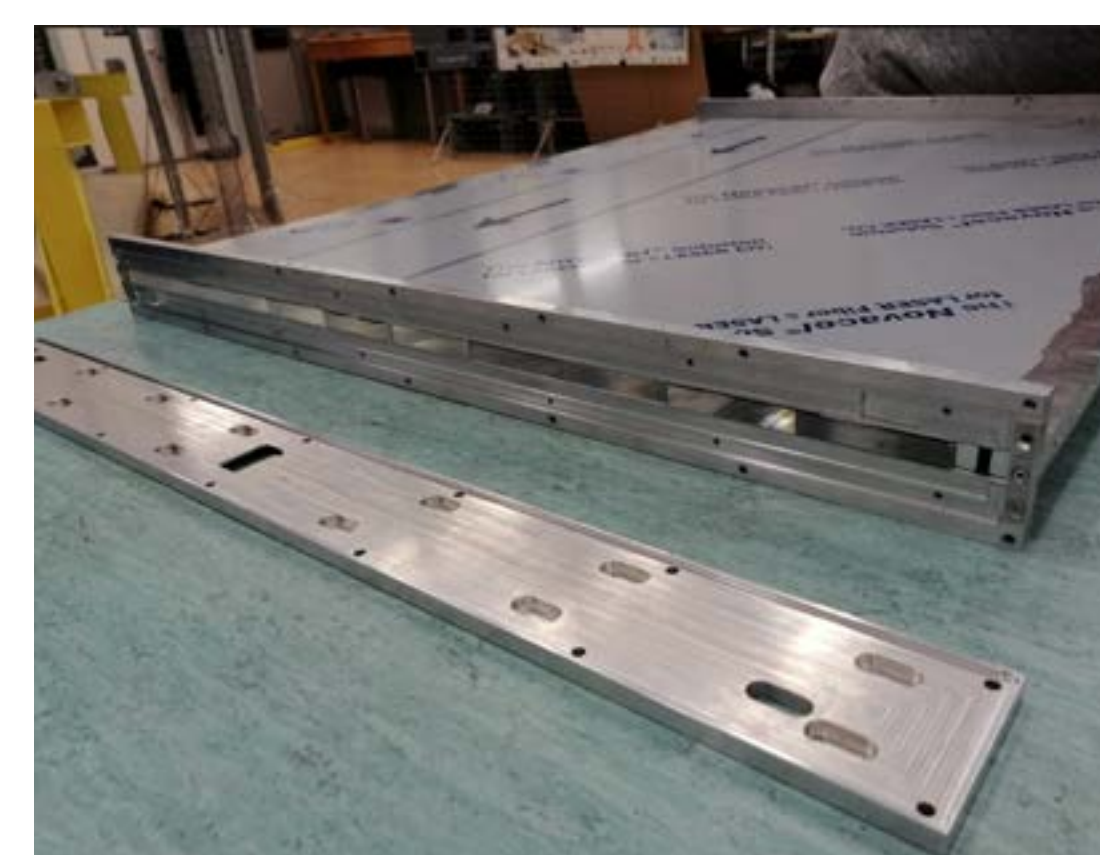
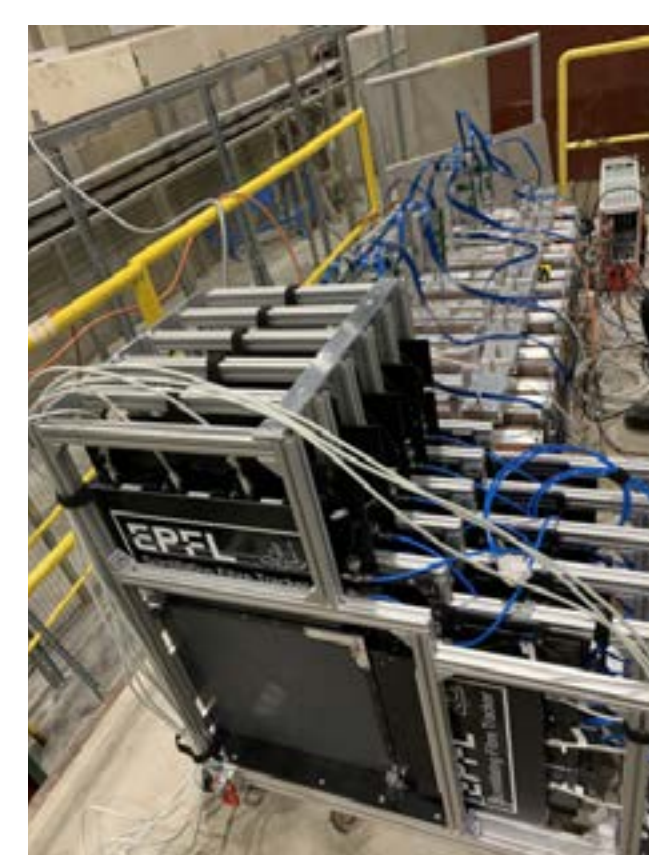
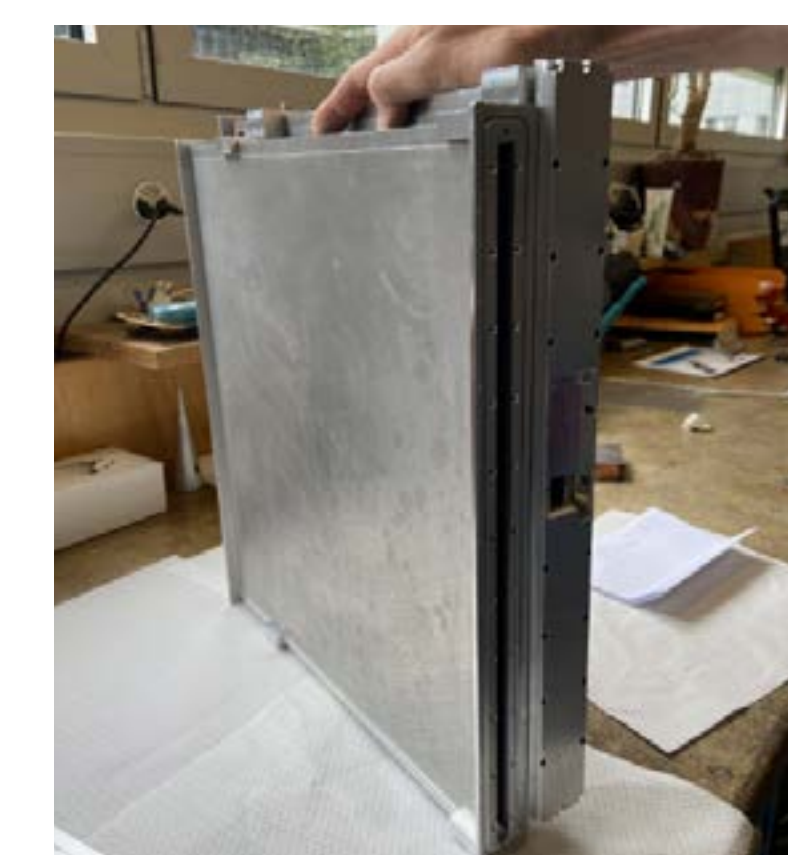
- Scintillating fibre planes and $40X_0$ of Tungsten creates a sampling ECAL system.
- Five tracking layers of two scintillating fibre planes sensitive in the x and y directions.
- Provide timestamp for emulsion event.

Muon System and HCAL

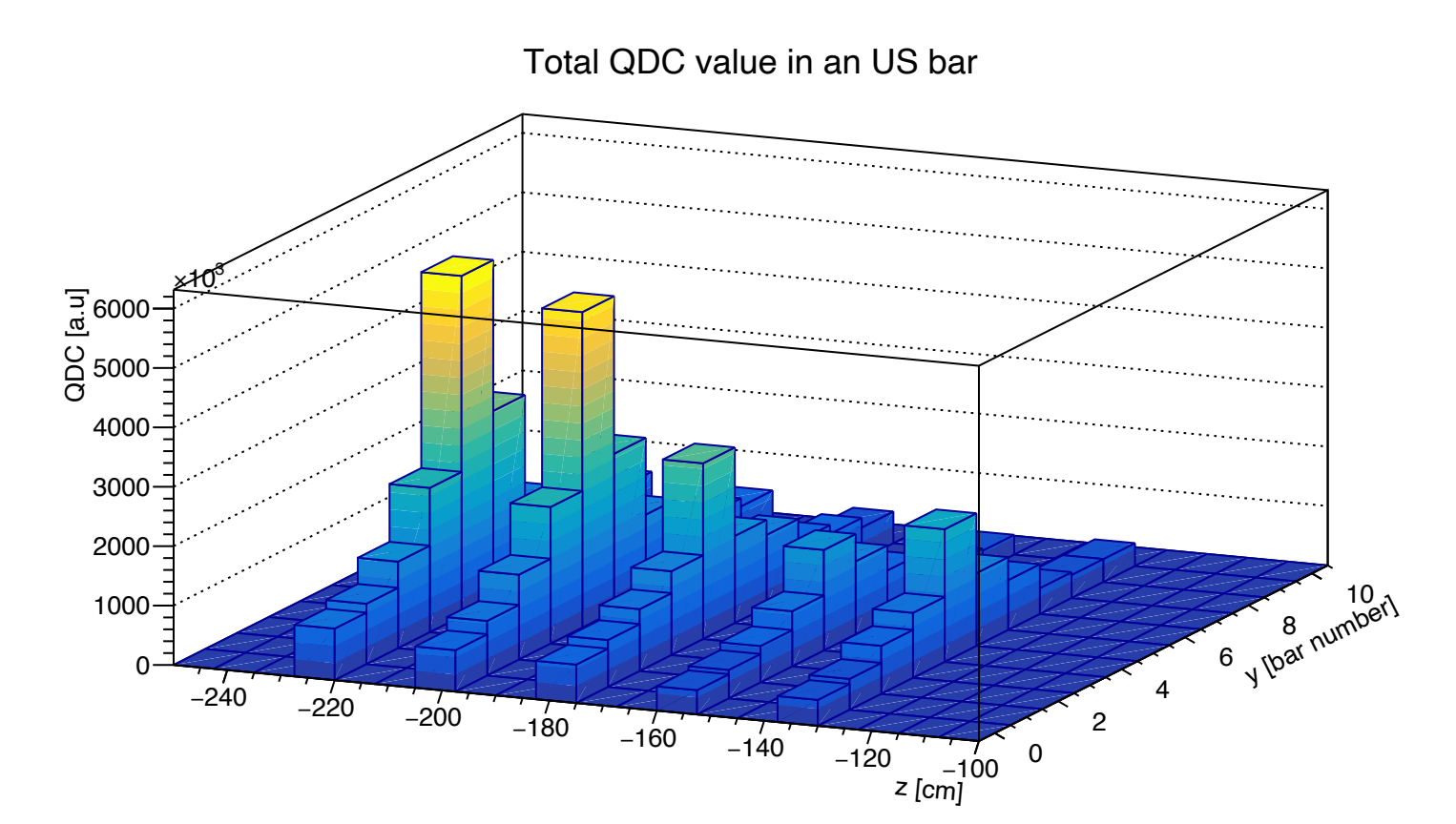
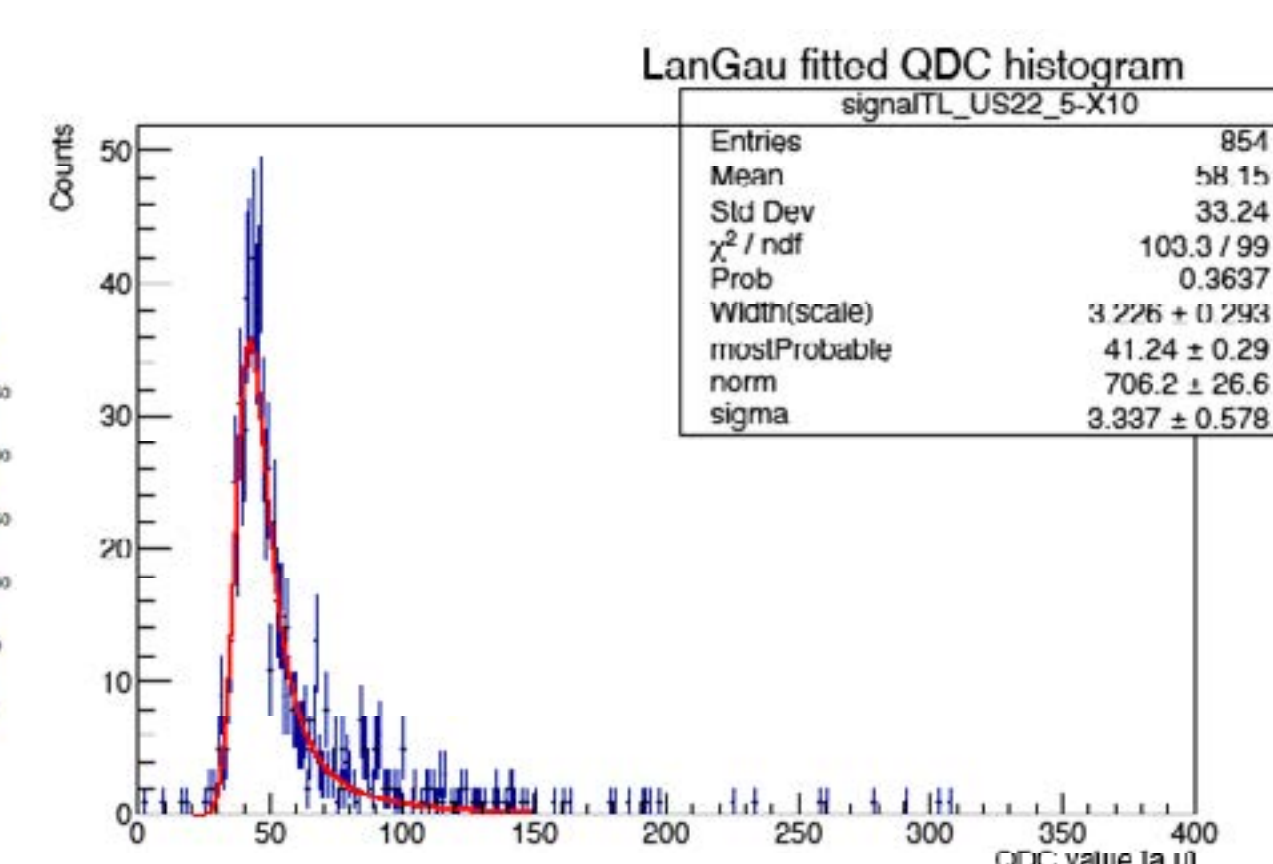
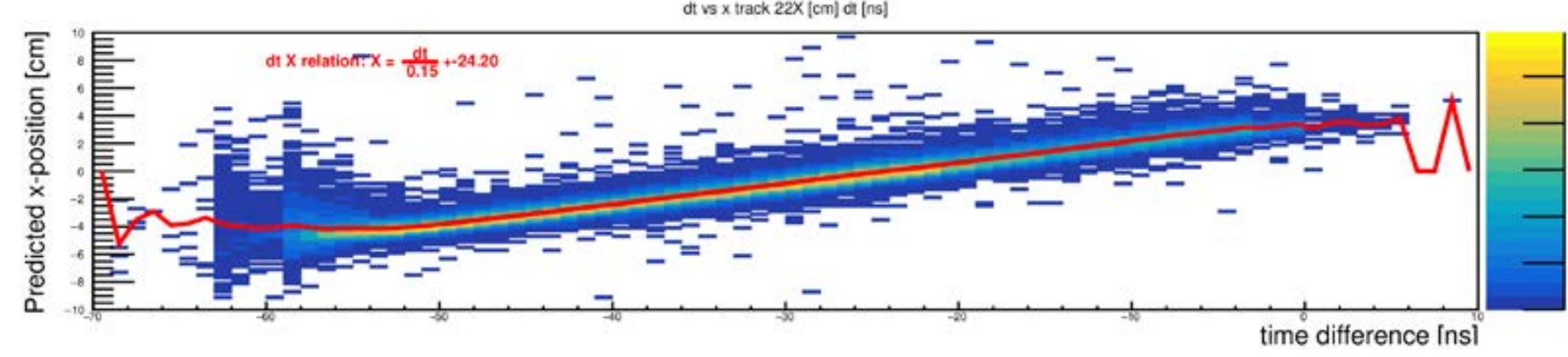
- Muon system and iron provide 9.5 interaction lengths. Acts as a non-homogeneous hadronic calorimeter.
- Identify neutrino CC interactions.
- Detector planes formed by plastic scintillating bars read out by SiPMs with 200ps timing resolution.



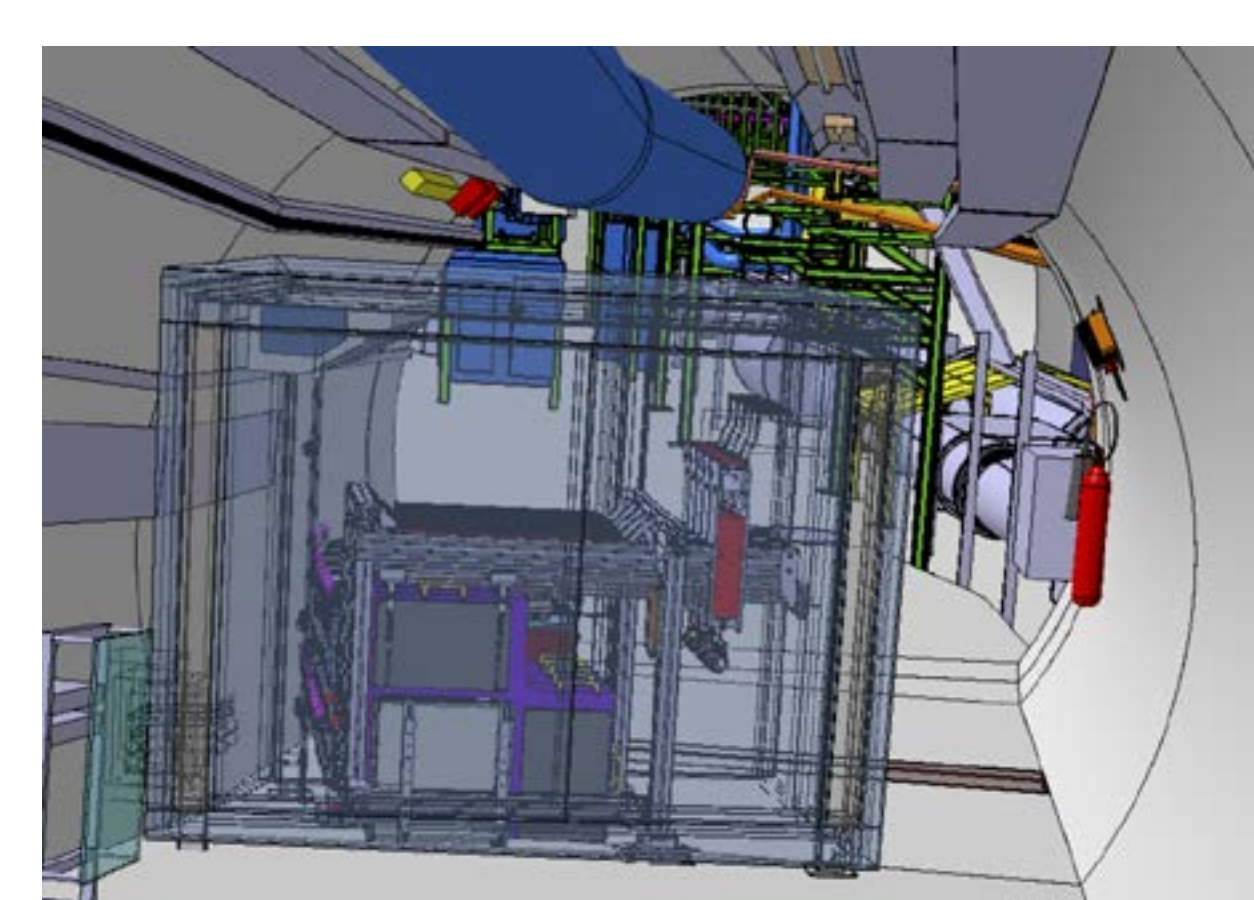
- ### Data Acquisition
- DAQ boards based on the Cyclone V FPGA.
 - Triggerless DAQ and online event building.
 - Same electronics used for all active detectors.



Testbeams - π -beams from 100 GeV to 300 GeV.



Installation and Commissioning in T118



- One emulsion chamber installed now, the rest in 2022.
- Target tracker installation in late November, followed by Muon system.
- Neutron shielded cold box under construction.
- Commissioning of SND@LHC ongoing since early September, beginning in T118 in early December.