NA65/DsTau

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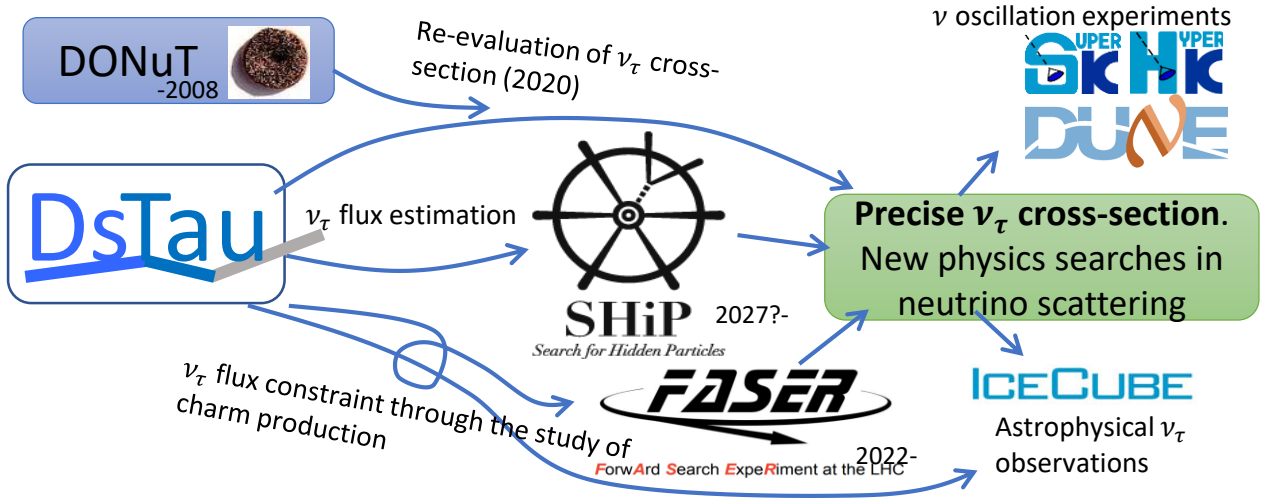
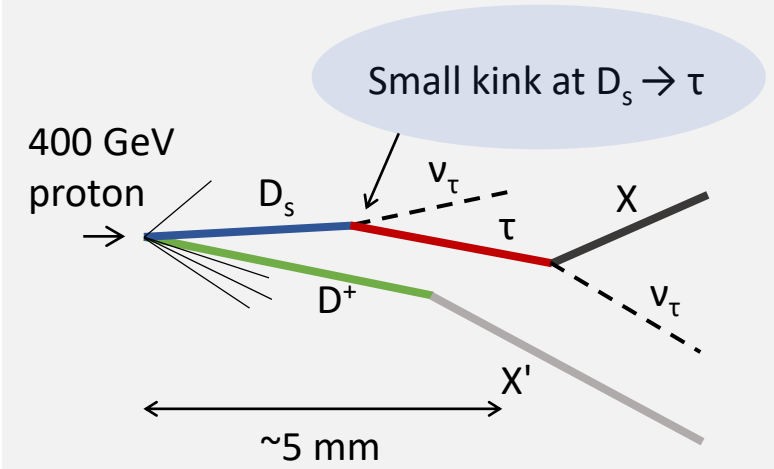
The NA65/DsTau experiment at the CERN SPS

- Study of ν_τ production for future tau neutrino experiments.
  - Measurement of **D_s double differential production cross section**
  - Reduce uncertainty of ν_τ flux from >50% to 10% → Fundamental input for future ν_τ experiment: SHiP, and indirectly FASER
- Forward charm physics, charm/gluon PDF





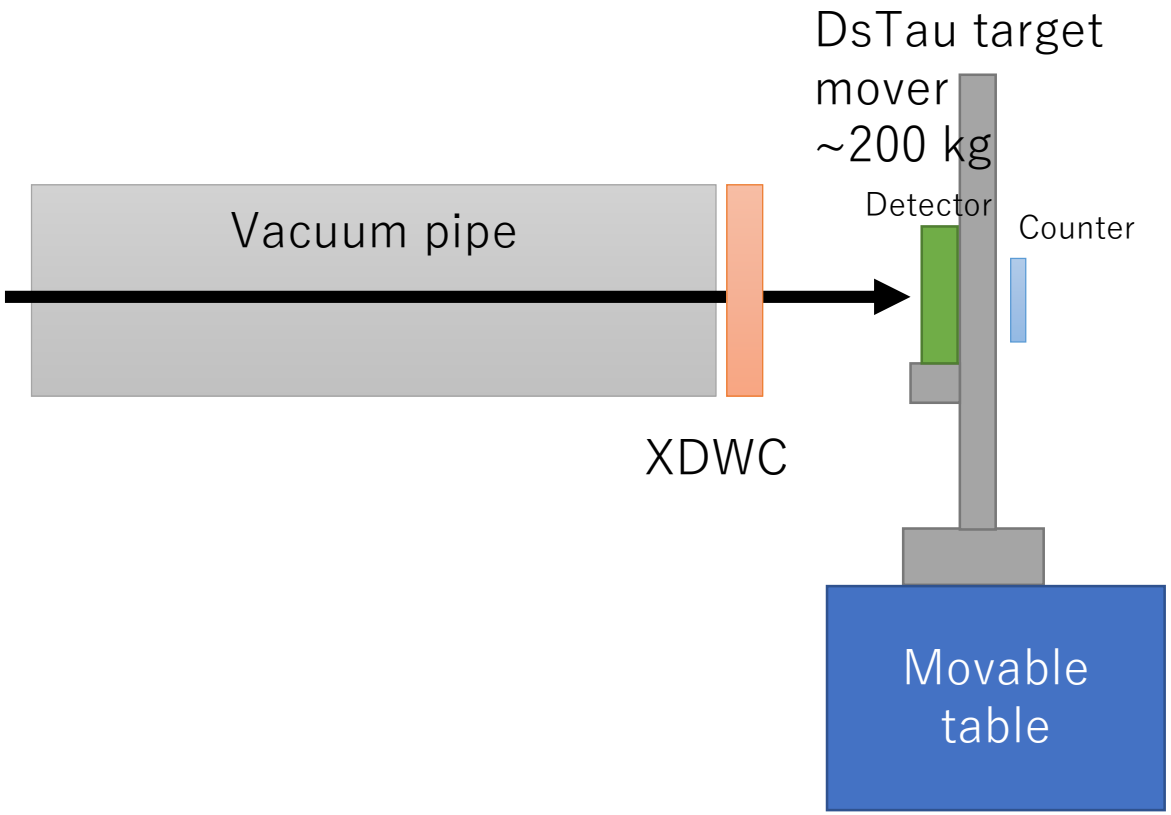
- Principle of the experiment
  - Detection of "**double-kink + charm decay**" topology within 10 mm.
  - 4.6×10^9 protons, $\mathbf{2.3 \times 10^8}$ proton interactions in target, 10^5 charm pairs, $1000\ D_s \rightarrow \tau \rightarrow X$ detected events.

Beam requirement

- Beam: 400 GeV proton
- Beam size/shape: 2 cm x 2 cm.
  - Gaussian-like shape is better than square-like profile.
  - A sigma of distribution ~10 mm (not RMS)
  - The same beam profile as 2021 run would be good (TBC)
- Beam intensity: a few x 10^5/spill
- Spill structure: flatter is better

Requirements for infrastructure

1. Movable table (Nikhef table)
2. Beam profile monitor (XDWC at PPE172 with readout)
3. Vacuum pipe to transport proton beam
4. Storage of the target mover (1m x 2 m + some carton boxes)



2021 setup