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## Study of tau-neutrino production at the CERN SPS

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DsTau is a project which has been proposed at the CERN SPS to study tau-neutrino production aiming at providing important data for future  $\nu_\tau$  studies. A precise measurement of the  $\nu_\tau$  cross section would enable a search for new physics effects in  $\nu_\tau$  CC interactions. It also has practical importance for the next generation experiments for neutrino oscillation studies and astrophysical  $\nu_\tau$  observations. The practical way of producing a  $\nu_\tau$  beam is by the sequential decay of  $D_s$  mesons produced in high-energy proton interactions. However, there is no experimental measurement of the  $D_s$  differential production cross section in fixed target experiments using proton beams, which leads to a large systematic uncertainty on the  $\nu_\tau$  flux estimation. The DsTau project aims to reduce the systematic uncertainty in the current  $\nu_\tau$  cross section measurement to 10% or below, by measuring the  $D_s$  differential production cross section (especially longitudinal dependence). For this purpose, emulsion detectors with spatial resolution of 50 nm will be used allowing the detection of  $D_s \rightarrow \tau \rightarrow X$  double kinks in a few mm range. During the physics run,  $2.3 \times 10^8$  proton interactions will be collected in the tungsten target, and 1000  $D_s \rightarrow \tau$  decays are expected to be detected. Results from the pilot run in 2018 will be presented together with a prospect for physics runs in 2021 and 2022.

### Collaboration name

The DsTau Collaboration

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