



Poster session 2 – Tuesday 5 July

P2.031 SHiP: a new facility with a dedicated detector for studying tau-neutrino properties and nucleon structure functions

D Bick

Universität Hamburg, Germany

on behalf of SHiP collaboration

SHiP is a new general purpose fixed target facility, whose Technical Proposal has been recently reviewed by the CERN SPS Committee, who recommended that the experiment proceeds further to a Comprehensive Design phase. In its initial phase, the 400GeV proton beam extracted from the SPS will be dumped on a heavy target with the aim of integrating 2×10^{20} pot in 5 years. A dedicated detector downstream of the target will allow to probe a variety of models with light long-lived exotic particles and masses below a few GeV/c^2 . Another dedicated detector will allow the study of neutrino cross-sections and angular distributions, and it will be the focus of the poster. ν_τ deep inelastic scattering cross sections will be measured with a statistics 1000 times larger than currently available, with the extraction of the F_4 and F_5 structure functions, never measured so far and allow for new tests of lepton non-universality with sensitivity to BSM physics. Moreover, ν_τ 's will be distinguished from $\bar{\nu}_\tau$'s, thus providing the first observation of the $\bar{\nu}_\tau$. With ν_μ scattering it will be possible to reduce by about 50% the current uncertainty on the strange content of the nucleon in the range of the x variable between 0.05 and 0.3, complementary to LHC measurements. The detector will be based on several techniques developed for the OPERA experiment at LNGS.