Contribution ID: **46** Type: **not specified**

Prompt neutrinos in the forward region at the LHC

Monday 9 November 2020 19:40 (10 minutes)

We calculate the prompt muon and tau neutrino (and antineutrino) number of events in the far forward region at the LHC. In a region as such, the heavy quark decay dominates the tau neutrino production. The hadronic charm and bottom hadron production cross section is evaluated at the next-to-leading order in perturbative QCD. The intrinsic transverse momentum of the initial partons becomes important in this region and is modeled with a Gaussian function, with the parameter determined by fitting to the LHCb experimental data. The heavy quark fragmentation is described by the Peterson fragmentation function. Thousands of charged current tau (anti)neutrino events can be expected for a 1 m long lead neutrino detector located 480 m down the stream for pp collision at a center-of-mass energy $\sqrt{s}$ = 14 TeV and an integrated luminosity L = 3000 fb^{-1}. However, the uncertainties from the perturbative QCD higher-order corrections are large in the neutrino event distribution.

Authors: GARZELLI, Maria Vittoria (Universita e INFN, Firenze (IT)); RENO, Mary Hall; DIWAN, Milind Vaman (Brookhaven National Laboratory (US)); Dr BAI, Weidong (University of Iowa); JEONG, Yu Seon (Theoretical Physics Department, CERN)

Presenter: Dr BAI, Weidong (University of Iowa)

Session Classification: QCD and Neutrinos