

Forward Neutrinos from Charm at the LHC and Prompt Neutrinos at IceCube

Thursday, August 4, 2022 11:50 AM (30 minutes)

The Forward Physics Facility (FPF) at the LHC will detect neutrinos produced in proton collisions. In addition to neutrinos from pion and kaon decays, there will be significant contribution, particularly for ν_e and ν_τ flavors, from decay of charmed mesons. We present our predictions for the neutrino flux from charm decays as evaluated in different QCD approaches: the next-to-leading order collinear factorization (NLO), and the k_T -factorization approach. We use QCD parameters, such as the scales, the choice of parton distribution functions, and the fragmentation function, which were determined from fitting the LHCb data for D-meson production. We also calculate the neutrino energy distribution, for neutrinos of all flavors, that are produced from charmed meson decays. We show that FPF will be able to provide valuable information about the QCD, by measuring neutrino flux. We also present our results for the prompt neutrinos, which are decay products of charmed mesons produced in interactions of cosmic rays with the atmosphere, of relevance to IceCube.

Attendance type

In-person presentation

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