



Contribution ID: 271

Type: not specified

Enhanced Long-Lived Dark Photon Signals at the LHC

Wednesday, 25 August 2021 13:30 (20 minutes)

We construct a model in which the standard model is extended by a hidden sector with two gauge $U(1)$ bosons. A Dirac fermion ψ charged under both $U(1)$ fields is introduced in the hidden sector which can be a subcomponent of the dark matter in the Universe. Stueckelberg mass terms between the two new gauge $U(1)$ fields and the hypercharge gauge boson mediate the interactions between the standard model sector and the hidden sector. A remarkable collider signature of this model is the enhanced long-lived dark photon events at the LHC than the conventional dark photon models; the long-lived dark photons in the model can be discriminated from the background by measuring the time delay signal in the precision timing detectors which are proposed to be installed in the LHC upgrades and have an $\mathcal{O}(10)$ pico-second detection efficiency. Searches with current LHCb data are also investigated. Various experimental constraints on the model including collider constraints and cosmological constraints are also discussed.

Primary authors: DU, Mingxuan (Nanjing University); TRAN, Van Que (Nanjing University); LIU, Zuowei (Nanjing University)

Presenter: DU, Mingxuan (Nanjing University)

Session Classification: Searches for the BSM Physics at the LHC and Future Hadronic Colliders

Track Classification: Searches for the BSM Physics at the LHC and Future Hadronic Colliders