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Possibilities for dark photon search in T2K near detector

Present study considered the model of heavy dark photon with kinetic mixing. The parameter space of the model is tested for the possibility of leptonic dark photon decays detection in time-projection chambers of ND280 detector of T2K experiment. Event selection makes background suppression reach the level of single events for the current T2K statistics thus for the dark photon mass range of 300 MeV to 1 GeV the estimated sensitivity for the dark photon mixing parameter ϵ is up to 10^{-3} .

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