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itle: Study of Leptonic Ds+ Decays Using Belle II Detector

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Standard Model and CP Violation The Belle II Experiment GEANT4 Simulation (GSIM)

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Abstract:

Of the processes involving charm quarks, many measurements can be normalized by knowing the branching fractions of Ds \pm meson decays. In some New Physics (NP) scenarios, the leptonic decay rate of Ds \pm could be modified. Also, measurement of leptonic Ds \pm decay enables the precision test of LQCD calculation of decay constants and provides additional constraints on NP. The aim of this study was to perform the sensitivity study of Ds \pm ' \pm ' decays at Belle II detector situated at SuperKEKB asymmetric electron-positron collider. Due to the neutrino (which will miss our detection) and our constraint to only do a partial reconstruction we first attempted to show a proof of concept for its detection and signal identification. For this purpose, we performed signal Monte Carlo study for \pm 0DDs \pm KK \pm 0DDs \pm KK \pm 1 meson decays. We simulated the decays and attempt to create signal. Investigated the recoil mass of Ds \pm 1. The final aim was to perform sensitivity of Ds \pm to test lepton flavour universality (LFU). However, due to COVID-19, we were not able to accomplish this.

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