Contribution ID: **295** Type: **not specified**

New Physics effects in the semileptonic $\Lambda_c \to \Lambda\mu^+\nu_\mu$ decay

The analysis of the $c \to s\mu^+\nu_\mu$ transitions in baryonic (Λ) decays for the search of new physics in the presence of right-handed neutrinos would be an interesting aspect of the phenomenological study. We have followed the effective field theory approach for the low-energy effective Hamiltonian comprising the dimension-six operators, and rely on the Lattice QCD and Heavy quark spin symmetry (HQSS) for the form factor data. The new physics operators are constrained by using the available measurements of mesonic charm decay transitions, and the Wilson coefficients are determined through a χ^2 fit using the Miniut package. The differential decay width is derived to study the $\Lambda_c \to \Lambda\mu^+\nu_\mu$ decay for the effect of right-handed neutrinos. We make the predictions of differential decay width and forward-backward asymmetry (A_{FB}) for the mode to explore the effect of the new physics on the baryonic decay through right-handed neutrinos to motivate future measurements.

Section

Nuclear physics (Section 1)

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Track Classification: The V International Scientific Forum "Nuclear Science and Technologies": Nuclear physics (Section 1)