Contribution ID: **106** Type: **Talk**

New physics in s->d semileptonic transitions: rare hyperon vs. kaon decays

Friday, 2 June 2023 16:45 (25 minutes)

Rare semi-leptonic decays of kaon and hyperon play an important role in testing the standard model of particle physics and searching for new physics. Based on the recent progresses from BESIII, NA48/2 and LHCb Collaboration, in this work we studied two kinds of semi-leptonic decays of kaon and hyperon, which are characterized as $s \to d\nu\bar{\nu}$ and $s \to d\mu^+\mu^-$ transitions at the quark level. We have applied the low-energy effective Hamiltonian approach to calculate the branching ratios and angular observables of relevant decay channels and used the isospin symmetry and chiral perturbation theory to address the non-perturbative contributions. By analyzing advantages and disadvantages of two types of semi-leptonic kaon and hyperon decays for constraint on new physics, we found that the anticipated BESIII data of the hyperon decays can better constrain the effect of new physics compared to kaon decays of the same kind. However, the conclusion will change when considering the effect of renormalization group evolution. It indicates that the loop effects from renormalization group evolution are important in this context, when relating the low-energy effective field theory to new physics models in the UV.

Primary authors: Prof. 耿, 立升 (北京航空航天大学); Prof. MARTIN CAMALICH, Jorge (La Laguna University); Dr 史, 瑞祥 (北京航空航天大学)

Presenter: Dr 史, 瑞祥 (北京航空航天大学)

Session Classification: Flavor