



Contribution ID: 10

Type: Oral

$B \rightarrow K + a$ decays in QCD factorization and revised bounds on ALP couplings

Rare flavor-changing processes such as $B \rightarrow K a$ decay offer sensitive probes of axion-like particles (ALPs) for masses below a few GeV. We study this process in the framework of QCD factorization and ALP effective theory, in which the ALP couples to the Standard Model fermions through shift-invariant derivative interactions. In contrast to previous studies, where flavor violation arises solely from flavor-changing ALP couplings, we also include the contributions proportional to flavor-conserving ALP couplings, in which the flavor change is mediated by the weak interactions of the Standard Model. Based on this analysis, we derive model-independent bounds on both flavor-changing and flavor-conserving ALP couplings at low energies. Then we consider the UV scenario of a “minimally flavor-violating ALP”, which features flavor-universal ALP–fermion couplings at very high energies, and evaluate the resulting constraints on the UV couplings.

Primary author: NEUBERT, Matthias (Johannes Gutenberg University Mainz)

Presenter: NEUBERT, Matthias (Johannes Gutenberg University Mainz)

Session Classification: Parallel - BSM

Track Classification: BSM and Flavour