



MEETING OF THE AMERICAN PHYSICAL SOCIETY DIVISION OF PARTICLES AND FIELDS

Contribution ID: 118

Type: **Presentation**

Semileptonic B-meson decays to light pseudoscalar mesons with lattice QCD

Thursday, 3 August 2017 11:21 (18 minutes)

We present the status of an ongoing lattice-QCD calculation of form factors for exclusive semileptonic decays of B mesons with both charged currents ($B \rightarrow \pi \ell \nu$, $B_s \rightarrow K \ell \nu$) and neutral currents ($B \rightarrow \pi \ell^+ \ell^-$, $B \rightarrow K \ell^+ \ell^-$). The results are important for constraining or revealing physics beyond the Standard Model. This work uses MILC's (2+1+1)-flavor ensembles, with the HISQ action for the sea and light valence quarks, and the clover action in the Fermilab interpretation for the b quark. Simulations are carried out at four lattice spacings down to 0.088 fm, with both physical and a few nonphysical sea-quark masses. We present preliminary results for correlation-function fits and the chiral-continuum extrapolation of the form factors.

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Session Classification: Quark and Lepton Flavor

Track Classification: Quark and Lepton Flavor