

Semileptonic decays of $B_{(s)}$ mesons to light pseudoscalar mesons on four-flavor HISQ ensembles

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We report 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 three lattice spacings down to 0.088-fm, with both physical and unphysical sea-quark masses. We present preliminary blinded results for the form factors $f_+(q^2)$, $f_0(q^2)$, and $f_T(q^2)$ (in terms of momentum transfer q^2), along with an examination of systematic errors. Our preliminary results include studies of z -expansion methods to extend the kinematic range.

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