

Update on $B \rightarrow D^* \ell \nu$ form factor at zero-recoil using the Oktay-Kronfeld action

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We update the calculation of $B \rightarrow D^* \ell \nu$ form factor at zero-recoil using the Oktay-Kronfeld (OK) action for bottom and charm quarks. Heavy quark action is nonperturbatively tuned. The flavor changing currents are improved to $\mathcal{O}(\lambda \approx \Lambda_{QCD}/2m_Q)$, $Q = b, c$ at tree-level in the HQET power counting. We use the HISQ action for the light spectator quark with several valence quark masses. The calculation is done on the $2+1+1$ -flavor MILC HISQ ensembles at $a \approx 0.12$ and 0.09 fm with pion mass $M_\pi \approx 310$ MeV. The excited state contamination in the matrix elements is controlled by using multi-state fits on correlators with multiple source-sink separations and stabilized using an empirical Bayesian technique.

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