

# P-wave form factors from the inclusive semileptonic $B \rightarrow X_c \ell \nu$ decays

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We report our estimation for the Isgur-Wise form factors for the inclusive semileptonic  $B \rightarrow X_c \ell \nu$  on 2+1-flavor lattice QCD.

The Möbius domain-wall fermion action is used for light, strange, charm and bottom quarks. The structure function receives contributions from various exclusive modes, including the dominant S-wave states  $D_s^{(*)}$  as well as the P-wave states  $D_s^{**}$ . In this work, we identify and separate these contributions in the lattice data, from

which we put some constraints on the  $B_s \rightarrow D_s^{**} \ell \nu$  form factors. Our work takes into account the structure functions for the cases of zero-recoil and non-zero recoil.

**Primary author:** BAILAS (\*), Gabriela (KEK)

**Co-authors:** HASHIMOTO, S.; KANEKO, T.

**Presenter:** BAILAS (\*), Gabriela (KEK)

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