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Semileptonic form factors for exclusive Bs -> K l nu and Bs -> Ds l nu decays

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We present our nonperturbative Lattice QCD calculation to determine semileptonic form factors for exclusive $B_s \to K\ell\nu$ and $B_s \to D_s\ell\nu$ decays. Our calculation is based on RBC-UKQCD's set of 2+1 dynamical flavor gauge field ensembles and in the valence sector we use domain wall fermions for up/down, strange, and charm quarks, whereas bottom quarks are simulated with the relativistic heavy quark action. The continuum limit is based on three lattice spacings and form factors over the full q^2 range are shown.

These form factors are the basis to predict ratios studying lepton flavor universality or, when combined with experimental results, to obtain CKM matrix elements $|V_{cb}|$ and $|V_{ub}|$. Due to different experimental and theoretical set-ups, these alternative b-decay channels may also help to shed light on the tension between the analysis of inclusive and exclusive decays or may further serve as proxy for corresponding B decays.

Authors: FLYNN, Jonathan (University of Southampton); Mr HILL, Ryan C. (University of Southampton); JUETTNER, Andreas; SONI, AMARJIT (BNL); TSANG, J Tobias (The University of Edinburgh); WITZEL, Oliver (University of Colorado Boulder)

Presenter: WITZEL, Oliver (University of Colorado Boulder)

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