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The $B \rightarrow \pi l \nu$ and $B_s \rightarrow K l \nu$ form factors from 2+1 flavors of domain-wall fermions and relativistic b-quarks

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We report results for the $B \rightarrow \pi$ and $B_s \rightarrow K$ semileptonic form factors using lattice QCD with domain-wall light quarks and relativistic b-quarks. We use the 2+1 flavor domain-wall Iwasaki gauge configurations generated by the RBC and UKQCD collaborations at two lattice spacings of $a \sim 0.08\text{fm}$ and $a \sim 0.11\text{fm}$. Our lightest pion mass is about 290MeV . We perform the chiral and continuum extrapolations using hard-pion $SU(2)$ chiral perturbation theory, and extrapolate the form factors to the full kinematic range using the model independent z -expansion. Finally, we fit the numerical lattice data for $B \rightarrow \pi$ simultaneously with the experimental measurements from BaBar and Belle to obtain the CKM matrix element $|V_{ub}|$.

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