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$B \rightarrow \pi$ semileptonic form factors from unquenched lattice QCD

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We update the lattice calculation of the $B \rightarrow \pi$ semileptonic form factors with a focus on the applications to the CKM matrix element $|V_{ub}|$. We use the MILC AsqTad 2+1-flavor lattice configurations at four lattice spacings and compute the matrix elements using the full-QCD valence quarks. We extrapolate the lattice data to continuum physics using the staggered chiral perturbation theory in the hard pion and SU(2) limit. We use a functional method to do the model-independent z expansion of the lattice extrapolation which extends the result to the full kinematic range. To obtain $|V_{ub}|$, we simultaneously fit the most recent experimental measurements from BaBar and Belle with our lattice result. The updated value of $|V_{ub}|$ and its error budget are presented.

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