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$B \rightarrow \pi \ell \nu$ and $B \rightarrow \pi \ell \ell$ decay form factors from HISQ/NRQCD valence quarks on the $N_f = 2 + 1$ asqtad ensembles

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Form factors and related phenomenology for the $B \rightarrow \pi \ell \nu$ and $B \rightarrow \pi \ell \ell$ decays will be presented. The simulations use HISQ light and NRQCD b valence quarks on the MILC $N_f = 2 + 1$ asqtad ensembles, with pion momenta covering the full kinematic range for the decays. Large pion momenta (up to 2.6 GeV) data are analyzed via the hard pion ChPT motivated modified z -expansion. The leading sources of uncertainty and the next generation of calculations to address them will be discussed.

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