High precision study of $B^*B\pi$ coupling in unquenched QCD

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The $B^*B\pi$ coupling is a fundamental parameter of chiral effective lagrangian with heavy-light mesons and can constrain the $B \rightarrow \pi l \nu$ form factor in the soft pion limit which will be useful for precise determination of $|V_{ub}|$.

We compute the $B^*B\pi$ coupling with the static heavy quark and the $O(a)$-improved Wilson light quark. Simulations are carried out with $n_f = 2$ unquenched $12^3 \times 24$ lattices at $\beta =1.80$ generated by CP-PACS. The chiral limit is also taken using data at 4 different quark masses.

Following the quenched study by Negishi et al., we employ the all-to-all propagator technique with more than 100 low eigenmodes as well as the HQET action with HYP smeared link to improve the statistical accuracy.