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Bottomonia screening masses in 2+1 flavor QCD

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The sequential melting of the bottomonia states is one of the important signals for the existence of a Quark Gluon Plasma. The study of bottomonia spectral functions on the lattice is a difficult task for many reasons. Calculations based on NRQCD, that are commonly used for such purpose, are not applicable at high temperatures. In this work we propose a new method to study this problem by calculating the spatial screening masses of bottomonia states. We calculate the spatial meson correlators and extract the screening masses for mesons in different quantum channels using highly improved staggered quark (HISQ) action for bottom quarks and dynamical 2+1 flavor QCD HISQ gauge configurations. The typical lattice we choose are of size $N_s^3 \times N_\tau$ where $N_s = 4N_\tau$ and $N_\tau = 8, 10, 12$. We consider the temperature range $T = 300-1100$ MeV. We show that for $T > 500$ MeV the temperature dependence of the screening masses of the ground state bottomonia are compatible with the expectations based on uncorrelated quark-antiquark pairs.

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