

High Energy Physics - Theory

Unruh effect and Holography

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We study the Unruh effect on the dynamics of quarks and mesons in the context of AdS/CFT correspondence. We adopt an AdS metric with the boundary Rindler edge extending into a bulk Rindler-like horizon, which yields the thermodynamics with Unruh temperature verified by computing the boundary stress tensor. We then embed in it the probe fundamental string and D7 brane which are dual to the quark and meson in the Unruh vacuum, respectively. Using the standard procedure of holographic renormalization, we calculate the chiral condensate, and also the spectral functions for both quarks and mesons. From these, we extract the corresponding strength of random force of the Langevin dynamics and observe that it can characterize the phase transition of meson melting. We find most of the dynamical features are qualitatively similar to the ones in the thermal bath dual to the AdS black hole background, though could be quite different quantitatively.

Comments: 1+26 pages, 11 figures, v2 minor correction, v3 typos corrected

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