

APCTP SEMINAR

Stiff equation of state for a holographic nuclear matter as instanton gas(*)

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ZOOM Webinar

In a holographic model, which was used to investigate the color superconducting phase of QCD, a dilute gas of instantons is introduced to study the nuclear matter. The free energy of the nuclear matter is computed as a function of the baryon chemical potential in the probe approximation. Then the equation of state is obtained at low temperature. Using the equation of state for the nuclear matter, the Tolman-Oppenheimer-Volkov equations for a cold compact star are solved. We find the mass-radius relation of the star, which is similar to the one for quark star. This result is understood from the stiffness and the large speed of sound of the instanton gas considered here.

(*) Based on the work (arXiv:2107.14450[hep-th]) done with K. Ghoroku, K. Kashiwa, Y. Nakano and F. Toyoda

■ ZOOM Webinar

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