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Calculation of Quark Condensate in Nuclear Matter with the Chiral Symmetry Spontaneous Breaking Lagrangian

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Abstract: Using the chiral symmetry spontaneous breaking Lagrangian with mean-field approximation, we investigate the in-medium quark condensate $\langle\bar{q}q\rangle$. It is found that the condensate decreases as the nuclear matter density ρ increases. Meanwhile, the desent deviates from the linear decrease and becomes remarkably slow as the density of the nuclear matter further increases. It shows that the chiral symmetry spontaneous breaking is only partially restored in densed nuclear matter.

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