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Chiral symmetry breaking in strong magnetic background.

Content :

We discuss the vacuum structure for chiral symmetry breaking in presence of strong magnetic field. We use an explicit construct for the ground state in terms of quark antiquark operators in presence of strong magnetic fields. In a 3 flavor Nambu JonaLasinio model, we solve for the condensate function by minimising the thermodynamic potential that give rise to the mass gap equation for the quarks. Strong magnetic fields appear to act as a catalysis for the mechanism of chiral symmetry breaking. We obtain the equation of state for the charge neutral strange quark matter at finite temperature that can be of relevance for proto neutron stars endowed with magnetic fields. We also solve the gap equation and obtain the equation of state within the three favor NJL model at high temperature and zero chemical potential but with strong magnetic fields as may be relevant for the matter produced in relativistic heavy ion collision experiments.

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