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# Lattice study of deconfinement in two-color dense quark matter

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In this work we studied the two-color QCD at finite density and low temperature within lattice simulation. The aim was to study of the interaction within a static quark-antiquark pair in two-color dense quark matter. To this end we performed measured the Polyakov loop correlation functions and calculated the color averaged, color singlet and color triplet grand potentials. Having determined the renormalized grand potentials, we calculated the renormalized grand potential of a single quark/antiquark, average Polyakov loop, string tension and the Debye mass. In addition we calculated the quark number induced by a static quark antiquark pair and its specific energy.

The observed confinement/deconfinement transition at finite density manifests itself in an increasing value of the Polyakov loop. Contrary to the finite temperature confinement/deconfinement transition, the finite density transition does not show a region of rapid rise of the Polyakov loop. For this reason we conclude that the observed transition from confinement to deconfinement at finite density is smooth. Moreover, we observe string breaking at large chemical potentials, which we believe is also a manifestation of the confinement/deconfinement transition.

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