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Lattice study of the confinement-deconfinement phase transition in SU(3) gluodynamics in rotating frames

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In ultrarelativistic heavy-ion collision (NICA, FAIR, etc.) the creation of quark-gluon plasma with a nonzero angular momentum is expected, especially in off-central collision. The rotation of QCD matter shoud leads to a number of nontrivial physical phenomena, and further study of rotation is of a great interest. In this work the influence of the rotation on the confinement/deconfinement phase transition in SU(3)-gluodynamics was investigated using the Monte-Carlo lattice simulations. The calculations have been performed in rotating reference frame, where the rotation is introduced using an external gravitational field. To study the confinement/deconfinement transition the Polyakov loop and its susceptibility have been computed for various values of the temperature and angular velocity. The obtained results show that the critical temperature of the confinement/deconfinement phase transition in SU(3)-gluodynamics increases with a growth in the angular velocity. It is shown that this effect does not depend on the lattice size and boundary conditions used.

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