

Abstract Submitted
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Canonical approach to the finite density lattice QCD with winding number expansion (II) hadronic observables YUSUKE TANIGUCHI, University of Tsukuba, RYUTARO FUKUDA, The University of Tokyo, AT-SUSHI NAKAMURA, Hiroshima University, SHOTARO OKA, Rikkyo University, SHUNTARO SAKAI, Kyoto University, ZN COLLABORATION — The grand canonical ensemble is a difficult subject to treat in the lattice QCD because of the sign problem. The canonical partition function is related to the grand canonical one through the fugacity expansion. In this talk our collaboration perform the fugacity expansion by a method of the hopping parameter expansion in temporal direction for the lattice QCD: winding number expansion. The canonical partition function is constructed for $N_f = 2$ QCD starting from gauge configurations at zero chemical potential and in the imaginary chemical potential region. After derivation of the canonical partition function we study the chemical potential dependences of hadronic observables like chiral condensate, quark number density and chiral susceptibility. We also evaluate the Lee-Yang zeros of the complexified grand partition function and study its volume dependence.

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