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Gluon and ghost correlation functions of 2-color QCD at finite density

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SU(2) is the simplest non-abelian gauge theory with fermions without sign problem. Therefore its study on the lattice is a benchmark for other non-perturbative approaches at finite density.

We study the Landau-gauge 2-point and 3-point correlation functions of the gauge sector and the running gauge coupling at finite density, and compare them to the vacuum case.

We observed no significant effect of the finite density, except for some screening of the gluons. Moreover, no strong signature of the phase change (if not a lattice artifact) in the properties of quarks are observed in the gauge sector, in contrast to the finite-temperature case. This indicates that the finite-density physics is essentially driven by the quarks, rather than by the gluons.

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