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## Topological susceptibility of two-color QCD at low temperature and high density

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We study the chemical potential ( $\mu$ ) dependence of the topological susceptibility with two-color two-flavor QCD. We find that at temperature  $T \sim T_c/2$ , where  $T_c$  denotes the critical temperature at zero chemical potential, the topological susceptibility is almost constant until  $\mu/m_{PS} = 1.6$ , while at  $T \sim T_c$ , it decreases significantly from the  $\mu = 0$  value in a high  $\mu$  regime. In this work, we perform the simulation for  $\mu/T \leq 16$ , which covers even the low temperature and the high chemical potential regime. In this regime, we introduce a diquark source term, which is characterized by  $j$ , into the action. We also show our results for the phase diagram in a low temperature regime ( $T \sim T_c/2$ ), which is obtained after taking the  $j \rightarrow 0$  limit of physical observable.

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