



Contribution ID: 176

Type: **Parallel Talk**

QCD topology with background electromagnetic fields

Wednesday, 2 August 2023 10:00 (20 minutes)

Non-orthogonal background electromagnetic fields generate a non-zero expectation value for the topological charge in QCD. For sufficiently weak fields, a linear response is expected. This linear response has been studied and related to the QCD contribution to the axion-photon coupling, for which we give preliminary results at finite lattice spacing. We also investigated the dependence of the topological susceptibility with the magnetic field around T_c . A reweighting of the fermion determinant to mimic the zero modes of the Dirac operator is shown to significantly reduce the lattice artifacts for the susceptibility. In this work we use lattice simulations with 2+1 flavors of improved staggered quarks at the physical point, including background magnetic and (imaginary) electric fields.

Topical area

QCD at Non-zero Temperature

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Session Classification: QCD at Non-zero Temperature