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Deconfinement and chiral aspects of the QCD crossover under magnetic fields: static-quark entropy and chiral susceptibility

Friday 7 November 2025 15:10 (20 minutes)

We investigate the static-quark entropy in QCD in the presence of external magnetic fields, using its temperature peak as a pseudocritical deconfinement indicator. Our calculations employ HISQ fermions with a tree-level improved Symanzik gauge action at physical quark masses, on lattices with temporal extents $N_\tau = 8, 12$ and fixed aspect ratio $N_\sigma/N_\tau = 4$. A two-dimensional (T, eB) analysis allows us to determine $S_Q(T, eB)$, from which we extract $T_{pc}^Q(eB)$ and perform a continuum extrapolation.

In the weak-field region studied, $T_{pc}^Q(eB)$ exhibits a mild decrease, from ~ 155 MeV at $eB = 0$ to ~ 152 MeV at $eB = 0.14 \text{ GeV}^2$. We compare this deconfinement indicator with the total chiral susceptibility and the baryon-electric charge correlation χ_{11}^{BQ} to explore their distinct responses in the $T - eB$ plane.

Parallel Session (for talks only)

QCD at nonzero temperature and density

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