

Localization and topology in high temperature QCD

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At high temperature part of the spectrum of the quark Dirac operator is known to consist of localized states. This comes about because around the cross-over temperature to the quark-gluon plasma, localized states start to appear at the low end of the spectrum and as the system is further heated, states higher up in the spectrum also get localized. Since localization and the crossover to the chirally restored phase happen around the same temperature, the question of how the two phenomena are connected naturally arises. Here we speculate on the nature of possible gauge configurations that could support localized quark eigenmodes. In particular, by analyzing eigenmodes of the staggered and overlap Dirac operator we check whether a dilute gas of calorons or other forms of topological charge can play a major role in localization.

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