

Polyakov loop fluctuations in the presence of external fields

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We study susceptibilities of real and imaginary parts as well as modulus of the Polyakov loop in an effective model of gluons and quarks. In pure SU(3) gauge theory, the ratios of these susceptibilities exhibit a clear discontinuity at the deconfinement temperature while ratios calculated in 2+1 QCD become smoothed and vary between corresponding pure gauge asymptotic values. This suggests these quantities as an excellent probe of deconfinement.

We propose a schematic model of the Polyakov loop and the quark, and show that the model captures these trends in lattice QCD data. We also discuss scaling properties of the susceptibilities.

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