

Finite-volume scaling of Polyakov loop susceptibilities

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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 and depend weakly on the lattice size, which suggests these quantities as an excellent probe of deconfinement [1]. The ratios calculated in 2+1 QCD become smoothed and show also a strong lattice size dependence [2].

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.

[1] P. M. Lo, B. Friman, O. Kaczmarek, K. Redlich, C. Sasaki, Phys. Rev. D **88**, 014506 (2013)

[2] A. Bazavov, N. Brambilla, H.-T. Ding, P. Petreczky, H.-P. Schadler, A. Vairo, J. H. Weber, Phys. Rev. D **93** 114502 (2016)

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