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Critical Phenomena in the Nonextensive Nambu Jona-Lasinio Model

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We present a thermodynamical analysis of the nonextensive, QCD-based, Nambu - Jona-Lasinio model (NJL) of strongly interacting matter in the critical region. It is based on the nonextensive generalization of the Boltzmann-Gibbs (BG) statistical mechanics, used in the NJL model, to its nonextensive version. This can be introduced in different ways, depending on different possible choices of the form of the corresponding nonextensive entropies, which are all presented and discussed in detail. Unlike previous attempts the present approach fulfils the basic requirements of thermodynamical consistency. Detailed calculations of entropy and specific heat are presented. Phase diagram in the critical region, in the in the (T,μ) plane, is shown for different values of non-extensivity.

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