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Thermodynamical analysis of a strongly interacting system with isospin imbalance using LSMq N_f=2. The cold case. Non-trivial one Loop correction performing techniques.

Abstract

The Linear Sigma Model with Quarks (LSMq) Lagrangian with both chiral as pionic condensates and with isospin chemical potential exibits a merge of the sigma and the charged pions inverse propagators in a very intricate manner. To performed the One Loop Correction of the model, we have developed a technique called "Asymptotic Renormalization Formalism" (ARF) to extract analytically the divergences of any integral letting us to renormalize the theory. Also we have implemented a Ward Identity which constrains the model, in particular it give us a relation between the coupling constants and the vacuum masses. The model has been fitted using the Lattice QCD data, showing a very accurate description of the termodynamical variables.

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