



Contribution ID: 16

Type: **not specified**

Thermodynamics of the $O(N)$ model in 1+1 dimensions: Analytical study versus lattice simulations

Tuesday, May 8, 2012 11:00 AM (30 minutes)

The thermodynamics of the $O(N)$ model in 1+1 dimensions is studied applying the auxiliary field method. In order to compute the thermodynamical quantities we apply the CJT formalism within the Hartree-Fock approximation extended by sunset diagrams. The numerical results for the renormalized mass of the scalar particles, the pressure, the trace anomaly and the energy density are presented and compared with fully nonperturbative results coming from finite-temperature lattice simulation of the model. We find that when including the sunset type diagrams into the computation of the effective potential there is a very good correspondence between the numerical results of the CJT formalism and the lattice study. At asymptotically high temperatures the pressure approaches the Stefan Boltzmann limit of a gas of $N-1$ free massless particles, which is a direct consequence of the nonlinear constraint.

Author: Mrs SEEL, Elina (ITP Frankfurt University)

Co-authors: Dr GIACOSA, Francesco (ITP University Frankfurt); Dr LOTTINI, Stefano (ITP Frankfurt University)

Presenter: Mrs SEEL, Elina (ITP Frankfurt University)