

STATISTICAL PHYSICS SEMINAR

February 20th, 2019.

Wednesday, 11.00

ELTE TTK Northern Building 2.54

Zsolt Szép

MTA-ELTE Theoretical Physics Research Group

Thermodynamics of the $O(4)$ model from the Φ -derivable approximation

We investigate the effects of higher order truncations of the two-particle irreducible (2PI) action on the equilibrium FFT-based numerical solution of the model and the description of the phase transition. We find that the two-loop level truncation represents an improvement over the Hartree-Fock truncation, but at the next level of the truncation, the solution to the coupled propagator and field equations is lost in some temperature range. This feature is a result of the IR sensitivity of the propagator equation and makes impossible the direct determination of the critical temperature in the chiral limit. Vertex resummation provided by the $1/N$ expansion to next to leading order in the 2PI effective action tames this problem to some degree. At NLO in the 2PI- $1/N$ expansion we determine the critical exponents and the universal scaling function and compare them with their lattice counterparts.

1117. Budapest, Pázmány Péter sétány 1/A (Északi tömb)

Room 2.54

<http://glu.elte.hu/~statfiz/index.html>