
Multi-loop calculation of critical exponents in the model A of critical dynamics

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Abstract

In this talk we will discuss multi-loop calculations in the model A of critical dynamic, which describes isotropic ferromagnets. The main object of interest in this model is dynamical critical exponent z , which governs the phenomenon of critical slowing down - an unlimited increase of the relaxation time of the order parameter approaching the critical point.

We apply renormalization group method to find this exponent at the four-loop approximation. We have developed a new method to significantly reduce the amount of computations by appropriate grouping of the diagrams. This method significantly reduce the number of integrands and transform them to more simple form. We've adopted Sector Decomposition method for models of critical dynamics and used it for a numerical calculation of the diagrams.

The results for dynamical critical exponent compared with other theoretical results and with experimental data.

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