

## The equation of state three-dimensional Ising-like system

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The equation of state for the 3D Ising-like system in an external field near the phase transition point is obtained. For this investigation it is used the Collective variables method suggested in [1]. The calculations are performed with the employment of non-Gaussian distributions for order parameter fluctuations. The  $\rho^4$ -model approximation is employed. We have found the explicit analytic form for the system free energy at  $T > T_c$  and  $T < T_c$  as sum of contributions from different regimes of order parameter fluctuations. Basing on these expressions generalized equation of state containing the dependence on both temperature and field is derived. It is reduced to the scaling form and compared with results obtained by Monte-Carlo simulations [2]. The qualitative agreement with simulation data is demonstrated.

1. Yukhnovskii I.R. Phase Transitions of the Second Order. Collective Variables Method (Singapore: World Scientific), 1987.
2. Engels J., Fromme L., Seinuch M. Nucl. Phys. B 655 (2003) p. 277–299.