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## Monte Carlo simulation of $\phi_2^4$ and $O(N) \phi_3^4$ theories

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We report lattice simulations of  $\phi_2^4$  and  $O(N) \phi^4$  models, performed by means a Monte Carlo method based on the all-order strong coupling expansion (worm algorithm). The investigation of the non-perturbative features of the  $\phi^4$  continuum limit in two dimensions lead us to the result  $g/\mu^2 = 11.15 \pm 0.06_{stat} \pm 0.03_{syst}$  for the critical coupling. Furthermore we present a study of the scaling behaviour of worm and loop size in two-dimensional  $O(N)$  model (non-linear  $\sigma$ -model) and three-dimensional  $\phi^4 O(N)$  model.

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