

# Tensor network study of two dimensional lattice $\phi^4$ theory

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The tensor renormalization group attracts great attention as a new numerical method because it is free of the sign problem. In addition to this striking feature, it has also an attractive aspect as a coarse-graining of space-time; that is to say, the computational cost scales logarithmically with the space-time volume. This fact allows us to aggressively approach the thermodynamic limit. While taking this advantage, we study the critical coupling in the continuum limit of the two dimensional lattice  $\phi^4$  theory. We present the numerical results along with the extrapolation procedure to the continuum limit, and compare them with the previous ones by Monte Carlo simulations and other tensor network schemes.

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