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Tensor renormalization group approach to critical phenomena via twisted partition functions

Wednesday 5 November 2025 09:00 (20 minutes)

We show that the tensor renormalization group offers a consistent framework in which twisted partition functions can be employed as order parameters to study critical phenomena. Investigating the two-dimensional Ising model and the three-dimensional $O(2)$ model as concrete examples, we demonstrate that critical points associated with spontaneous symmetry breaking can be located solely from the twisted partition functions. We further apply our method to the two-dimensional $O(2)$ model and show that the helicity modulus can be directly extracted from the twisted partition functions.

Parallel Session (for talks only)

Theoretical developments and applications beyond Standard Model

Authors: AKIYAMA, Shinichiro (University of Tsukuba); Dr JHA, Raghav G. (North Carolina State University); Mr MAEDA, Jun (Kyoto University); Prof. TANIZAKI, Yuya (YITP, Kyoto University); Dr UNMUTH-YOCKEY, Judah (Capital One)

Presenter: AKIYAMA, Shinichiro (University of Tsukuba)

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