Contribution ID: **134** Type: **not specified**

Tensor network formulation of the lattice Yang-Mills theory with spectral clustering

Thursday, 28 August 2025 17:12 (3 minutes)

Tensor network approach provides us with a novel framework to study the field theories on a lattice without resorting to the probabilistic interpretation. Therefore, the tensor network approach is expected to be free from the sign problem. On the other hand, we have to introduce a reliable regularization scheme to discretize the continuous degrees of freedom, otherwise we cannot perform tensor network computations. In this study, we introduce the spectral clustering technique, a non-linear dimensional reduction scheme commonly employed in machine learning, to initially compress tensor network representations before applying tensor network algorithms. We discuss its efficacy in tensor renormalization group calculations on the SU(2) and SU(3) Yang-Mills theories on a square lattice.

Primary author: AKIYAMA, Shinichiro

Co-author: Dr MUKHERJEE, Sayan (The University of Tokyo)

Presenter: AKIYAMA, Shinichiro

Session Classification: Poster

Track Classification: Poster presentation