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Area law in lattice systems

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Abstract

Area law states that information within a region depends on its surface degrees of freedom. In this talk, I demonstrate how area law appears in classical and quantum lattice models. In particular, I show that an important class of quantum states, namely, projected entangled pair state (PEPS), exhibits the area law. As a general result, it is shown that an area law is implied by a nite correlation length when characterized in terms of mutual information.

References

[1] M. M. Wolf, F. Verstraete, M. B. Hastings, and J. I. Cirac, "Area Laws in Quantum Systems: Mutual Information and Correlations," Phys. Rev. Lett. **100**, 070502 (2008).