

# Lower bounding entanglement in quantum many-body systems using entropic uncertainty relations

*Monday, 28 June 2021 16:30 (30 minutes)*

Experimentally quantifying entanglement is highly desired for applications of quantum simulation experiments to fundamental questions, e.g., in quantum statistical mechanics and condensed-matter physics. At the same time it poses a significant challenge because the evaluation of entanglement measures typically requires the full reconstruction of the quantum state, which is extremely costly in terms of measurement statistics. We derive an improved entanglement bound for bipartite systems, which requires measuring joint probability distributions in only two different measurement settings per subsystem, and demonstrate its power by applying it to currently operational experimental setups for quantum simulation with cold atoms.

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