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Type: Talk

Ubiquitous non-local entanglement with Majorana bound states

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Entanglement in quantum mechanics contradicts local realism, and is a manifestation of quantum non-locality. Its presence can be detected through the violation of Bell, or CHSH inequalities. Paradigmatic quantum systems provide examples of both, non-entangled and entangled states.

Here we consider entanglement of non-local degrees of freedom emerging from topological properties of many-body systems. Specifically, we consider a minimal complexity setup consisting of 6 Majorana bound states. We find that any allowed state in the degenerate Majorana space is non-locally entangled. We show how to measure (with available techniques) the CHSH-violating correlations, using either intermediate strength or weak measurement protocols.

Topic:

Mini-workshop: Quantum Foundations and Quantum Information

Summary

Primary authors: Dr ROMITO, Alessandro (Lancaster University); Prof. GEFEN, Yuval (Weizmann Institute of Science)

Presenter: Dr ROMITO, Alessandro (Lancaster University)

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