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סמינר

Many-body physics with superconducting circuits: noisy topological states

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Abstract

Topological states of matter are universal resources for quantum error correction and measurement-based quantum computation. Because topological states are insensitive to local measurements, it is often extremely hard to verify whether a quantum state is topological. In the case of symmetry-protected topological states, the topological nature of the state is determined by the degeneracies of an exponentially large matrix, namely the reduced density matrix. Here, we propose and realize a quantum circuit that allows us to directly probe these degeneracies using a polynomial number of gates only. We use this circuit to identify one dimensional symmetry-protected topological states, and distinguish them from topologically trivial states. Remarkably, our algorithm is robust to realistic noise sources, as long as some symmetries are preserved. In the last part of my talk, I will briefly mention a recent collaboration with the Ivry group from Technion, involving the realization of a new superconducting device with nontrivial properties.

*Refreshment at 12:15.

*כיבוד: 12:15

ההרצאה תתקיים ביום רביעי, ה-23.10.19 בשעה 12:30*
באודיטוריום המכון למצב מוצק, קומת כניסה

The lecture will take place on Wednesday, 23.10.19 at 12:30*
at the Solid State Institute auditorium, entrance floor

Host: Assistant Prof. Yoav Sagi