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**Simplified topological invariants for interacting insulators and superconductors<sup>1</sup>**

ZHONG WANG, Tsinghua University

Topological invariants are precise mathematical tools characterizing the topological properties of topological insulators and superconductors. While many simple and powerful topological invariants for noninteracting insulators and superconductors have been well established, the topological invariants for interacting systems are much less investigated, despite of their great importance in studies of topological states in interacting systems. In this talk I will report some recent progress in the search of topological invariants for interacting systems. I will show that topological invariants defined in terms of zero frequency Green's function are precise and convenient tools for interacting topological insulators and superconductors. They have much simpler forms compared to earlier interacting topological invariants, and have the potential to facilitate discoveries of new topological insulators with strong electron-electron interaction.

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