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Scaling behavior of many-body ground-state overlaps beyond the Anderson orthogonality catastrophe JIAHUA GU, KAI SUN, University of Michigan, Ann Arbor — In the thermodynamic limit, a many-body ground state has zero overlap with its slightly perturbed state, known as the Anderson orthogonality catastrophe. The amplitude of the overlap for two generic ground states typically exhibits exponential or power-law decay as the system size increases to infinity. In this talk, we show (with examples) that for two topologically different many-body states, there exists a sub-leading term beyond this scaling behavior. Such a sub-leading scaling behavior could be utilized to distinguish topologically different states or serve as a signature for topological phase transitions.

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