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Reflected entropy and Random Tensors

Reflected entropy is a new quantum informatic quantity that has been shown to be dual to the area of entanglement wedge cross-section in holographic theories.
We study reflected entropy of various states built form various Random Tensor Networks, a toy model that exhibits various features of holographic duality and show that the same result also holds.
For states built from a single (double) random tensor, we calculate the reflected entanglement spectrum and important non-perturbative effects around the entanglement wedge phase transition.
The reflected entanglement spectrum can be organized into different superselection sectors with the interpretation of a superposition of network states with different bulk geometry.
In the case of single random tensor there are two such sectors, whereas in the double tensor case we identify an infinite tower of sectors, each corresponding to different wedge cross-sectional area.
Moreover, we give a recipe for finding reflected entropy in arbitrary networks in classical limit using the language of linear programming.
We show that the reflected entropy of such states can be found by the solution of a integer program defined on the associated network graph.
The difference between this integer program and the relaxed linear program bounds the Markov gap of the state, which is dual to the number of corners of wedge cross-section in holographic theories.

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