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Title: Black hole evaporation and emergent geometry from gauge theory

Abstract: We show that important properties of evaporating black holes, such as the thermal radiation spectrum and the negative specific heat, are the consequences of generic features of dual gauge theory. By using the type IIA black zero-brane (black hole) and the dual matrix model as an concrete example, we describe how the black zero-brane evaporates into freely propagating D0-branes. The energy spectrum of emitted D0-branes is parametrically close to thermal when the black hole is large. The black brane, while initially cold, gradually becomes an extremely hot and stringy object as it evaporates. As it emits D0-branes, its emission rate speeds up and it evaporates completely without leaving any remnant. Hence this system provides us with a concrete holographic description of black hole evaporation without information loss. We also discuss how the geometry of the black hole, especially the horizon, can be encoded in gauge theory.