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Holographic Entanglement Entropy in Higher Dimensions ZACHARY POLONSKY, Colorado Sch of Mines — Maldacenas AdS/CFT conjecture gives strong evidence for the holographic nature of gravity and provides insight into the relationship between gravitational theories in $(D+1)$-dimensions and non-gravitational theories in D-dimensions. The reflection in the gravitational theory of quantum entanglement in the non-gravitational CFT was only understood in a very limited context until the holographic entanglement entropy (HEE) result of Ryu-Takayanagi (and its covariant generalization due to Hubeny-Rangamani-Takayanagi) provided considerable insight into the role that entanglement plays in Maldacenas duality. Tests of this result have been largely limited to the technically simple setting of 2+1-dimensional gravity which exhibits no local degrees of freedom, and to systems with obvious thermal interpretations. The purpose of this work is to further explore the HEE result in higher dimensional contexts as well as for systems with less obvious thermal interpretations. We consider both standard Schwarzchild-type black holes as well as the topological black holes of the BTZ-type. This work will provide further support for the HEE result and may very well provide insight into our understanding of how sensitive gravitation is to differences in dimension.

Zachary Polonsky
Colorado Sch of Mines

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