Title:	Holographic Entropy in Flat Space
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Abstract:	We have reviewed the idea of holographic entanglement entropy in Anti-de Sitter space us- ing Ryu-Takayanagi prescription. We briefly discuss the notion of holography and a study the geometry of AdS. We further study the covariant generalizations of the RT surface called the HRT surface. Using Light sheet construction of HRT surfaces as an inspiration we define natural analogue of AdS causal for flat space and we then draw parallels be- tween the two ideas. Our work demonstrates the existence of a natural equivalent to the concept of a “spherical subregion” that can be associated with the spatial infinity (spi) of asymptotically flat spacetime, despite its lack of smoothness. The holographic data of a spi-subregion can be expressed in terms of the asymptotic behavior of extremal surfaces on a bulk spatial slice or a pair of points on I + and I − . We also establish a natural notion of holographic entropy that can be linked to a spi-subregion, which is measured by the area of an extremal Ryu-Takayanagi surface in the bulk. These surfaces act as the waists of Asymptotic Causal Diamonds (ACDs), and in empty flat space, they are the direct equiv- alents of the topological black hole horizons of Casini-Huerta-Myers in empty AdS. Our work includes a computation of the areas of these extremal surfaces in the background of a Schwarzschild black hole. We propose that spi-subregion entropy represents a suitable target for an intrinsic definition of quantum entropy in the holographic dual of flat space quantum gravity.
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