THE QUANTUM SPACETIME SEMINAR SERIES

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Department of Theoretical Physics

Boundary operators in asymptotically flat space-time

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Zoom link shall be shared separately

In a recent paper an interesting framework for studying holography in flat spacetime has been proposed. In this note we explore the relationship between their proposal and the Celestial Holography. In particular, we find that in both the massive and in the massless cases the asymptotic boundary limit of the bulk time-ordered Green's function G is related to the Celestial amplitudes by an integral transformation. In the massless case the integral transformation reduces to the well known shadow transformation of the celestial amplitude. Now the relation between the asymptotic limit of G and the celestial amplitudes suggests that in asymptotically flat space-time if the scattering states are described by the conformal primary basis (and it's analytic continuation in Δ) then the boundary operators holographically dual to the (massless) bulk fields are given by the shadow transformation of the conformal primary operators living on the celestial sphere. In other words, conformal primary operators themselves are not boundary operators but their shadows are. This is consistent with the fact that in celestial holography the boundary stress tensor is given by the shadow transformation of the subleading soft graviton.

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