Institut Henri Poincaré

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String Theory in Greater Paris

Rencontres Théoriciennes

"Supergravité, théorie des cordes et théorie M"

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Holography from Singular Supertranslations on a Black Hole Horizon

We investigate the standard and dual BMS supertranslation generators on the black hole horizon and draw some conclusions about black hole physics. Recently, it has been shown that in addition to the conventional BMS supertranslation symmetries, there exists another infinite set of magnetic asymptotic symmetries that are referred to as dual BMS supertranslations. We show that the Dirac bracket between these generators exhibits a central term when the parameter functions have singularities in the complex stereographical coordinates on the sphere. Such singularities are related to Dirac-string-like configurations in the bulk, and should therefore be included in the set of acceptable transformations. We then demonstrate that this anomalous central term can be removed by including an appropriate gravitational Chern-Simons theory on the horizon. This implies that consistency of the asymptotic symmetry algebra requires a new structure on the horizon.

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