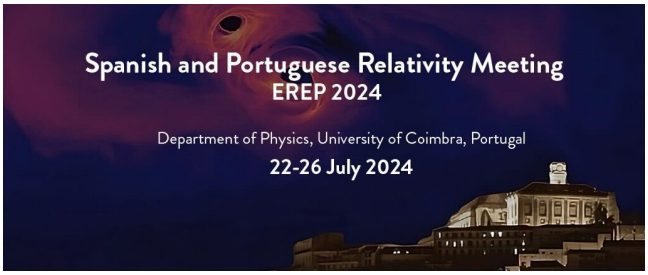

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News tensor on null hypersurfaces

Tuesday 23 July 2024 16:45 (15 minutes)

There is growing interest in understanding the radiative properties of particular classes of null hypersurfaces in space-time, such as weakly isolated horizons, from the viewpoint of the structure available at the conformal boundary of asymptotically flat space-times. In this work, a covariant definition of news tensor is given for general null hypersurfaces with arbitrary cosmological constant in 4 space-time dimensions. For the case of vanishing cosmological constant, this treatment yields the expression (in arbitrary conformal gauge) of the relevant components of Weyl tensor in terms of the news at infinity, and a generalised transport equation for the Geroch tensor. The differences between null hypersurfaces in the bulk and null infinity are reviewed. In particular, it is argued that this sort of characterisation of gravitational radiation by means of a news tensor only works for particular bulk cases, whereas its validity is more general at infinity when the cosmological constant vanishes.

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