



E I N L A D U N G

zum Vortrag

von

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über

“Zero rest-mass fields and the Newman-Penrose constants on flat space”

Abstract:

Zero rest-mass fields (the electromagnetic field and the linearised gravitational field) propagating on flat space and their corresponding Newman-Penrose constants are studied near spatial infinity. The aim of the analysis made in this article is to clarify the correspondence between data for the field on a spacelike hypersurface and their corresponding Newman-Penrose constants at future and past null infinity. To do so, the framework of the cylinder at spatial infinity is employed to show that, expanding the initial data as in terms spherical harmonics and powers of the geodesic spatial distance ρ to spatial infinity, the Newman-Penrose constants correspond to the data for the highest possible spherical harmonic at fixed order in ρ . As a by product of this analysis, it is shown that the electromagnetic constants at future and past null infinity are related as they correspond to the same portion of initial data. Moreover, it is shown that, this is true for generic data (not necessarily time-symmetric) and the mechanism responsible for this identification, encoded in the evolution and constraint equations, is discussed.

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