

Metric reconstruction from celestial multipoles

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Multipole moments are important quantities to characterize spacetimes. In General Relativity, the most general vacuum solution with no incoming radiation is parametrized by two sets of infinite multipole moments. In this talk I will show that non- radiative regions of spacetimes are completely characterized by a set of conserved celestial charges that consist of the Geroch-Hansen multipole moments, the generalized BMS charges and additional celestial multipoles accounting for subleading memory effects. Transitions among non-radiative regions, induced by radiative processes, are therefore labelled by celestial charges, which are identified in terms of canonical multipole moments of the linearized gravitational field. The dictionary between celestial charges and canonical multipole moments allows to holographically reconstruct the metric in de Donder or Bondi gauge outside of sources.

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