

Scattering on self-dual black holes

mardi 26 mars 2024 11:00 (1 heure)

Penrose's twistor theory demonstrated that the self-dual sector of Einstein's general relativity is completely integrable. This talk will explain how this can be exploited to generate efficient scattering formulae by developing a perturbation theory about a fully nonlinear self-dual sector rather than around flat space. The talk will focus on the example of a self-dual black hole background. Rather than exploit the twistor theory directly, we find that the complete integrability can be used to solve for linear fields on the background using some novel geometric structures, charged helicity raising and lowering operators, whose existence reflects the underlying simplicity of the self-dual sector in this case. As a first step, these generate analogues of momentum eigenstates on the background and are simple enough to complete their nonperturbative two-point scattering off the background. I will briefly explain how the twistor theory can be used to extend the construction to give formulae at all multiplicities.

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