



Department of
Theoretical Physics

THE QUANTUM SPACETIME SEMINAR SERIES

Gravitational EFT islands and the four-graviton amplitude
(Zoom Seminar)

Alexander Zhiboedov

(CERN)

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Time: 2.00 pm IST

Zoom link shall be shared separately



I will discuss constraints on the gravitational EFTs from causality, unitarity and crossing. For simplicity we focus on the four-graviton scattering in four spacetime dimensions and analyze the leading effect due to exchange by massive degrees of freedom. In particular, we place a bound on the R^3 coefficient in terms of the R^4 coefficient. To test the constraints we obtain nontrivial effective field-theory data by computing and taking the large-mass expansion of the one-loop minimally-coupled four-graviton amplitude with massive particles up to spin 2 circulating in the loop. Remarkably, we observe that the leading EFT coefficients obtained from both string and one-loop field-theory amplitudes lie in small islands. The shape and location of the islands can be derived from the dispersive representation for the Wilson coefficients using crossing and assuming that the lowest-spin spectral densities are the largest.