Gravitational S-matrix from CFT
Dispersion Relations

In scattering theory, dispersion relations of the Kramers-Kronig form are often used to reconstruct the real part of an amplitude from its imaginary part, which is typically easier to measure and/or to compute. It turns out that this technique can be generalized to conformal theories, where it enables to reconstruct four-point correlators from certain “double commutators”. One implication of this is that local operators are not independent of each other, but rather organize into analytic functions of spin. In this talk I will review a recent formula which enables this reconstruction, and present some of its applications to the gauge-gravity (AdS/CFT) correspondence, where it provides a uniquely efficient tool for computing AdS Witten diagrams at tree and loop level. Based on 1703.00278 and 1711.02031.