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Bootstrapping Gravity with Crossing Symmetric Dispersion Relations

Wednesday 12 November 2025 12:40 (30 minutes)

I will discuss how to derive bounds on Wilson coefficients in gravitational effective field theories using fully crossing symmetric dispersion relations. These sum rules naturally isolate finite subsets of low-energy couplings without relying on the forward limit or specific high-energy completions. I will show how we validate our method by matching bounds computed previously for scalar scattering with gravity as well as for supergraviton scattering. For graviton scattering we use crossing symmetric functions that combine various helicity combinations for the maximal-helicity violating amplitude. We also derive new bounds on the coupling of gravitons to a massive spin-4 state at tree level. These results demonstrate the power of crossing symmetric sum rules as a tool in the S-matrix bootstrap.

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