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n-shell relations between effective field theories of gluons

Tuesday 18 June 2024 10:00 (45 minutes)

It is known that universal algebraic structures govern the scattering amplitudes of a large web of theories, whose boundaries are however not well understood. In this talk, I will comment on effective field theory deformations of this web. Focussing on tree-level dynamics, I will explain that the scattering amplitudes of gluons minimally coupled to adjoint scalars contain all of the information required to construct those of a tower of gluon EFTs. For instance, I will present closed-form expressions for all-multiplicity scattering amplitudes in the (CP-even) EFT of gluons at mass dimension six, and for a specific choice of Wilson coefficients at dimension eight —all constructed through a systematic and explicit recycling of dimension-four data. I will also mention how one can recursively turn spacetime dimensions into operator dimensions. The technique behind those results is our extension of the so-called covariant color-kinematics duality introduced by Cheung and Mangan.

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