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Quantum correction to a new Wilson-line based action for Gluodynamics

Friday 25 August 2023 10:10 (20 minutes)

We discuss a new classical action that enables efficient computation of the gluonic tree amplitudes but does not contain any triple point vertices. This new formulation is obtained via a canonical transformation of the light-cone Yang-Mills action, with the field transformations based on Wilson line functionals. In addition to MHV vertices, the action contains also N^kMHV vertices, where 1≤k≤n−4, and n is the number of external legs. We computed tree-level amplitudes up to 8 gluons and found agreement with standard results. In order to systematically develop quantum corrections to this new action, we first study the one-loop effective action for the MHV action, where we were able to demonstrate that there are no missing loop contributions when treating the quantum corrections this way. Although successful, the effective action still uses the Yang-Mills vertices in the loop. To overcome this and make the MHV vertices explicit in the loop we derived the one-loop effective action via a different approach. We now extend this to obtain loop amplitudes using our new action. The presentation is based on a manuscript under preparation; https://doi.org/10.1007/JHEP11(2022)132 ; and https://doi.org/10.1007/JHEP07(2021)187.

Collaboration / Activity

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