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A Wilson-line based new classical action for gluodynamics

We derive a new classical action for gluodynamics that has no triple gluon vertices. The lowest-order vertex is the four-point MHV vertex. Higher point vertices include the MHV and MHV-bar vertices, which reduce to the corresponding amplitudes in the on-shell limit. In general, any n-leg vertex has $2 \le m \le n-2$ negative helicity legs. Thus it requires fewer diagrams to calculate amplitudes compared to the Cachazo-Svrcek-Witten (CSW) method. The new action is obtained by performing a canonical field transformation of the light cone Yang-Mills action, where the field transformations are directly related to the Wilson line functionals spreading over the self-dual and the anti-self-dual planes. We have checked the action by calculating tree amplitudes up to 8-point Next-to-Next-to-MHV and found agreement with the standard methods. Based on H. Kakkad, P. Kotko, A. Stasto JHEP07(2021)187.

Type of contribution

Contributed Talk or Poster

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