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Exploring straight infinite Wilson lines in the Self Dual and the MHV Lagrangians

We investigated the appearance of straight infinite Wilson lines lying on the self-dual plane in the context of the Self Dual sector of the Yang Mills theory and in connection to the Lagrangian implementing the MHV vertices (MHV Lagrangian) according to the Cachazo-SvrcekWitten (CSW) method. The plus helicity field in the MHV Lagrangian was already known to be a straight infinite Wilson line along the complex direction determined by the plus helicity polarization vector (i.e. it lies on the self-dual plane). We showed that this Wilson line expression satisfies the self-dual EOM, when the currents are restricted to the support on the light-cone. Additionally, we show that the minus helicity field is on the other hand given by a similar Wilson line, but with an insertion of the minus helicity gluon field somewhere on the line. Moreover, we discuss that the latter should be a part of a bigger structure, extending beyond the self-dual plane.

Collaboration / Activity

none

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