

This article gives and derives computational rules which are an analog of the so-called Cachazo-Svrcek-Witten (CSW) rules to the case of Yang-Mills theory coupled with a massive scalar field. The results are actually obtained in the previous work by the same authors [1], however, in this article detailed derivations of the CSW-type rules are presented in two Lagrangian-based methods. One is to use a canonical transformation in the light-cone gauge [2, 3] and the other is to use an action constructed in twistor space [4, 5]. It is these methods that have been utilized to confirm the original CSW rules for pure Yang-Mills theory. The article contains a nice review of these methods before presenting applications of them to the theory with a massive scalar field. Similar derivations of CSW-type rules for the theories with Higgs-gluon and Higgs-matter couplings are also discussed in the latter part of the article.

References

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