This is a review article on recent progress in tree-level scattering amplitudes of gauge theories. The review covers the two main calculatory techniques, *i.e.*, the CSW rules [1] and the BCFW recursion relations [2, 3]. Both of these were discovered right after Witten's proposal of twistor string theory [4] which generalized Nair's observation of the MHV (Maximally Helicity Violating) amplitudes in $\mathcal{N} = 4$ super Yang-Mills theory [5].

In this article a detailed review of the CSW rules, also known as the MHV diagram methods, is given with a refreshing narrative on historical and technical aspects of the developments. The authors are experts on this subject; they are in fact the first who showed the applicability of the CSW rules to one-loop amplitudes in $\mathcal{N} = 4$ super Yang-Mills theory [6]. The BCFW recursion relations, also known as the on-shell recursion relations, are similarly reviewed in detail with ample references.

The whole description is clear and pedagogical. Since the two techniques are now standard in the study of scattering amplitudes, regardless of supersymmetric extensions, this review should be useful particularly for beginners of this rapidly growing subject.

References

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