

Amplitudes

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Abstract

An introductory course of eight hours will be given in three lectures to the modern methods for computing scattering amplitudes in gauge theories at tree level and next to leading order (NLO). In the first lecture after a brief overview, the color and spinors algebra will be studied for tree level scattering amplitudes. The second lecture will be devoted to the BCFW (Britto-Cachazo-Feng-Witten) recursive relations of tree level scattering amplitudes, which allows for the computation of multi-parton amplitudes just exploiting the properties of factorization and the pole singularities of the trees. The third lectures is for NLO one-loop amplitudes by using the on-shell methods by the generalized perturbative unitarity. Implications for LHC will be briefly discussed.

Bibliography

Lectures and reviews

- M.Peskin (arxiv 11012414)
- Bern, Dixon, Kosower (07042798)
- Ellis, Kunszt, Melnikov, Zanderighi (11054319)
- Feng, Luo (11115759)

Articles

- Britto, Cachazo, Feng, (0501052)
- Special Issue of J. Phys. A44 (2011)
- Dixon (11050771)
- Britto (10124493)
- Bern, Huang (11031869)
- Brandhuber, Spence, Travaglini (11033477)
- Ita (11096527)

Book about QCD

- Ellis, Stirling, Webber, QCD at colliders physics, Cambridge (2003)