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Reviving the interference: framework and proof-of-principle for the anomalous gluon self-interactions in the SMEFT

Wednesday, 14 April 2021 21:00 (25 minutes)

Interferences between Standard Model (SM) and new physics effective operators are not positive-definite and therefore they can change sign over the phase space. If the contributions of the regions where the interference is positive and negative nearly cancel each other, interference effects are hard to measure. In this talk, I will present a brand-new method, based on the matrix element, to quantify the efficiency of an observable to separate the interference positive and negative contributions and therefore to revive the interference effects in measurements. I will apply this method to the anomalous gluon operator in the Standard Model Effective Field Theory (SMEFT), for which the interference suppression is well-known. I will show that we can get, for the first time, constraints on its coefficient using the interference only, which are similar to those obtained by including the square of the new physics amplitude. This method is fully generic, so it can be intensively applied for any new physics searches or measurements that present an interference suppression, even beyond the SMEFT. (Based on arXiv:2012.06595[hep-ph])

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