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On interference and non-interference in the SMEFT

Wednesday 3 January 2018 17:45 (15 minutes)

We discuss interference in the limit $m^2W/s \rightarrow 0$ in the Standard Model Effective Field Theory (SMEFT). Dimension six operators that contribute to $\psi^-\psi \rightarrow \psi'^-1\psi'2\psi'^-3\psi'4$ scattering events can experience a suppression of interference effects with the Standard Model in this limit. This occurs for subsets of phase space in some helicity configurations. We show that approximating these scattering events by $2 \rightarrow 2$ on-shell scattering results for intermediate unstable gauge bosons, and using the narrow width approximation, can miss interference terms present in the full phase space. Such interference terms can be uncovered using off-shell calculations as we explicitly show and calculate. We also demonstrate that the SMEFT expansion and the narrow width approximation do not commute, and discuss some phenomenological implications of these results

Summary

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