

# Hidden Analytic Structure of Two-Loop Higgs Amplitudes

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The discovery of a standard-model-like Higgs boson at LHC set a milestone in particle physics. For probing potential new physics beyond the Standard Model as well as understanding the details of Higgs physics, the high precision computation of Higgs amplitudes is mandatory. We obtain the two-loop Higgs plus three-parton amplitudes with high dimension operators in Higgs effective field theory. While efficient new methods have been developed in the computation, a particular focus will be on the analytic structure of the results, which take remarkably simple form and show hidden relations. In particular, the results satisfy the so-called maximal transcendentality principle, which conjectures that QCD and N=4 SYM results share the same leading transcendental parts. The simplicity of the results and the surprising correspondence indicate there may be further hidden analytic structure to be uncovered which hopefully may lead to a better way in computation in practice. We will discuss the correspondence as well as the possible impact.

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