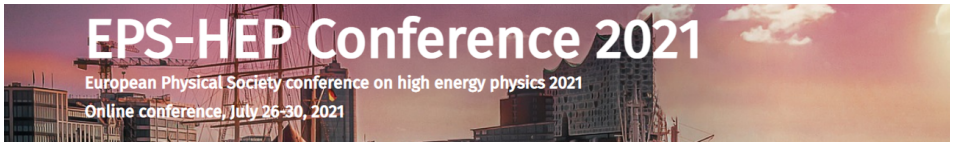

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Two-loop corrections to the Higgs trilinear coupling in classically scale-invariant theories

Tuesday 27 July 2021 10:04 (17 minutes)

The Higgs trilinear coupling provides a unique opportunity to probe the structure of the Higgs sector and the nature of the electroweak phase transition, and to search for indirect signs of New Physics. Classical scale invariance (CSI) is an attractive concept for BSM model building, explaining the apparent alignment of the Higgs sector and potentially relating to the hierarchy problem. A particularly interesting feature of CSI theories is that, at one loop, they universally predict the Higgs trilinear coupling to deviate by 67% from the (tree-level) SM prediction.
In this talk, I will show how this result is modified at two loops. I will present results from the first explicit computation of two-loop corrections to the Higgs trilinear coupling in classically scale-invariant BSM models. Taking as example a CSI variant of a Two-Higgs-Doublet Model, I will show that the inclusion of two-loop effects allows distinguishing different scenarios with CSI, even though the requirement of correctly reproducing the mass of the Higgs boson severely, as well as unitarity, restrict the allowed values of the Higgs trilinear coupling.

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Collaboration / Activity

Theory

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