Contribution ID: **35** Type: **not specified**

MatchingEFT.jl: An Automated Tool for Tree and One-Loop Level Matching

Saturday, 18 November 2023 10:10 (20 minutes)

We present MatchingEFT.jl, an automated tool to extract hard region contribution of the tree-level and one-loop 1PI amplitude, which can be matched to the standard model effective theory (SMEFT) operator basis in ABC4EFT.

FeAnGen4EFT performs the feynman diagram generation for the specific scattering process using the designed universal feynrules output file (UFO) and Qgraf. It offers the designated Feynman diagrams' amplitudes explicitly to provide non-trivial check for the gauge invariance. It will use FORM script to process extracting hard region expansion for the output from the previous step. These results will be given in a physical basis such as P-basis and Y-basis in ABC4EFT by using the on-shell amplitude basis method for a further cross-check. FeAmGen4SMEFT has been built with lightweight, generality, flexibility, specialization, and efficiency in mind.

These ingredients allow FeAmGen4SMEFT to have more applications beyond the matching based on the complete operator basis with the specific mass dimension offered by ABC4EFT. One of these applications includes the one-loop renormalization of arbitrary theories.

We have performed one-loop matching for some processes under the specified UV model and obtained consistent results with other papers.

Primary author: 杨, 成杰 (高能物理研究所 & 理论物理研究所)

Presenter: 杨, 成杰 (高能物理研究所 & 理论物理研究所)

Session Classification: Theory