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Constraining Effective Field Theories with Machine Learning

Wednesday 17 October 2018 09:00 (20 minutes)

We present powerful new analysis techniques to constrain effective field theories at the LHC. By leveraging the structure of particle physics processes, we extract extra information from Monte-Carlo simulations, which can be used to train neural network models that estimate the likelihood ratio. These methods scale well to processes with many observables and theory parameters, do not require any approximations of the parton shower or detector response, and can be evaluated in microseconds. We show that they allow us to put significantly stronger bounds on dimension-six operators than existing methods, demonstrating their potential to improve the precision of the LHC legacy constraints.

Application

Physics Analysis

Authors: BREHMER, Johann; CRANMER, Kyle; LOUPPE, Gilles; PAVEZ, Juan

Presenters: BREHMER, Johann; CRANMER, Kyle; LOUPPE, Gilles; PAVEZ, Juan

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