

Prospecting for New Physics through Flavor, Dark Matter, and Machine Learning

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Machine Learning for Event Generation and Fast Simulation

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LHC run 3 has just started and in the years leading up to 2040, we will see a 20-fold increase in available data. This forthcoming dataset will have enormous potential for a deeper understanding of the Standard Model and possible physics beyond it. At the same time, the endless possibilities of new physics hiding in this dataset pose a challenge, both for our analyses and also our simulation algorithms.

Modern machine learning has become a standard tool in our numerical tool box. In recent years, we have not only seen applications to boost the performance of existing algorithms, but also new analysis or simulation strategies. I will highlight how advancements in modern Machine Learning, especially using invertible networks also known as normalizing flows, help speed up crucial bottlenecks in event generation and detector simulation.

Summary

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