PARTICLE PHYSICS SEMINAR SERIES

Numerical Integration and Event Generation with Normalizing Flows

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Fermilab

Tuesday, January 28

4:00 pm - Rm 415 NSH

With the upcoming HL-LHC, the budget for computing will be insufficient to generate a sufficient amount of Monte-Carlo events for both signal and background predictions. The driving force behind these costs is the inefficiency of the Monte-Carlo phase space generators and the unweighting efficiencies. After a short review of traditional algorithms, I will introduce a new Machine Learning algorithm that uses Normalizing Flows for efficient numerical integration and random sampling. This approach is especially efficient in high-dimensional integration spaces. I will show some preliminary results obtained with the matrix element generator of Sherpa and discuss different choices of hyperparameters and their influence on the result.

PHYSICS