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MadNIS - A journey towards the first ML event generator

Monday 4 November 2024 13:50 (40 minutes)

High-precision simulations based on first principles are a cornerstone of LHC physics research. In view of the HL-LHC era, there is an ever-increasing demand for both accuracy and speed in simulations. In this talk, I will first explain the basic principles of LHC event generation and highlight current methodologies and their bottlenecks. Afterwards, I will delve into the MadNIS journey and illustrate how modern ML techniques, as well as advanced computing hardware, can alleviate these limitations. In particular, I will present recent advancements in neural importance sampling, the development of fast amplitude surrogates, and the latest progress on GPU-accelerated MadGraph.

Track

Presenter: WINTERHALDER, Ramon (Università degli Studi di Milano)

Session Classification: Plenary talks