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DijetGAN: A Generative-Adversarial Network approach for the simulation of QCD Dijet events at the LHC

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In the coming years, the experiments at the LHC will collect a significant amount of data which will require a similarly large increase in number of Monte Carlo (MC) events. This will force experiments to move to fast simulation to be able to produce the required number of MC events. At the same time, theorists are developing better but more time-consuming event generators that will put further pressure on the limited computing resources.
In this context, Machine Learning (ML) techniques are considered to significantly speed-up both the generation and the simulation step of the MC production. In the work that will be presented, two Generative Adversial Networks (GANs) are used to generate and simulate dijet events. The GANs are trained on events generated using MadGraph5 + Pythia8, and simulated and reconstructed in Delphes3. A number of kinematic distributions, both at MC truth-level and after the detector simulation, are considered and the GANs can reproduce the input distribution.

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Session Classification: Generative Models