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The calorimeter challenge and ODD detector

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There has been many recent developments in the application of machine-learning techniques to fast simulation of cascades in the calorimeters. This is usually the most time consuming part of the event simulation in high energy physics experiments. Most current efforts are focused and fine tuned to specific detectors, which makes it difficult to compare. We present a first fast calorimeter simulation challenge, with a three-difficulty level dataset. The purpose of this challenge is to spur the development and benchmarking of fast and high-fidelity calorimeter shower generation using deep learning methods. It will be possible to directly compare new deep learning approaches on common benchmarks. It is expected that participants will make use of cutting-edge techniques in generative modeling with deep learning, e.g. GANs, VAEs and normalizing flows.

As a follow up to this challenge, we would like to implement a benchmark calorimeter, within the Open Data Detector (ODD). Tracking system is already implemented in the ODD, and is an evolution of the successful detector from the Tracking Machine Learning Challenges. The calorimeter system will allow not only to benchmark the fast simulation of particle cascades, but creates unique opportunities for development and comparison of different reconstruction techniques, and particle flow methods.

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Classification de Session: Generative Models workshop