Contribution ID: **1071** Type: **Parallel Talk**

Generative Models for Fast Simulation of Electromagnetic and Hadronic Showers in Highly Granular Calorimeters

Friday, 8 July 2022 09:30 (15 minutes)

While simulation is a crucial cornerstone of modern high energy physics, it places a heavy burden on the available computing resources. These computing pressures are expected to become a major bottleneck for the upcoming high luminosity phase of the LHC and for future colliders, motivating a concerted effort to develop computationally efficient solutions. Methods based on generative machine learning models hold promise to alleviate the computational strain produced by simulation, while providing the physical accuracy required of a surrogate simulator.

This contribution provides an overview of a growing body of work focused on simulating showers in highly granular calorimeters, which is making significant strides towards realising fast simulation tools based on deep generative models. Progress on the simulation of both electromagnetic and hadronic showers will be reported, with a focus on the high degree of physical fidelity and computational performance achieved. Additional steps taken to address the challenges faced when broadening the scope of these simulators, such as those posed by multi-parameter conditioning, will also be discussed.

In-person participation

Yes

Primary authors: EREN, Engin (Deutsches Elektronen-Synchrotron (DE)); BUHMANN, Erik (Hamburg University (DE)); GAEDE, Frank (Deutsches Elektronen-Synchrotron (DE)); KASIECZKA, Gregor (Hamburg University (DE)); SHEKHZADEH, Imahn (Hamburg University (DE)); KRUGER, Katja (Deutsches Elektronen-Synchrotron (DE)); RUSTIGE, Lennart (CDCS / DESY); MCKEOWN, Peter (Deutsches Elektronen-Synchrotron (DE)); DIEFENBACHER, Sascha (Hamburg University (DE)); BIERINGER, Sebastian (Hamburg University (DE)); KORCARI, William (Hamburg University (DE))

Presenter: MCKEOWN, Peter (Deutsches Elektronen-Synchrotron (DE))

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