on e+e- Higgs/EW/Top Factories, October 5-7, 2022, in Hamburg

First ECFA WORKSHOP.

Contribution ID: 51

```
Type: Parallel session talk
```

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

Wednesday 5 October 2022 18:00 (15 minutes)

Simulation in High Energy Phyics (HEP) places a heavy burden on the available computing resources and is expected to become a major bottleneck for the upcoming high luminosity phase of the LHC and for future Higgs factories, motivating a concerted effort to develop computationally efficient solutions. Methods based on generative machine learning methods hold promise to alleviate the computational strain produced by simulation, while providing the physical accuracy required of a surrogate simulator.

In this contribution, we provide an overview of a growing body of work focused on simulating showers in highly granular calorimeters, which is making significant steps towards realistic 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.

Primary author: EREN, Engin (FLC (FTX Fachgruppe SFT))Presenter: EREN, Engin (FLC (FTX Fachgruppe SFT))Session Classification: WG 2: Physics Analysis Methods

Track Classification: WG2 - Physics Analysis Methods