



Contribution ID : 372

Type : **Oral talk**

Generative Models in Particle Physics

Friday, 2 December 2022 19:45 (15)

At present, the primary computational problems in particle physics experiments is the amount of computing resources to facilitate the slow low level simulation of particles passing through the detector material. A promising way to work around this problem driven by the low speed of the full low level Geant4 simulation is to use a data-driven surrogate generative models instead. Such models may be trained to directly simulate a higher level detector responses. However, evil is in details, not every surrogate model is equally useful from the physics perspective. In this talk we present our experience for developing fast simulation models for different use cases, in different conditions, and with different requirements, and demonstrate how strongly those details do affect the final solution. Future prospects of fast simulation approaches which are based on using neural networks are also discussed.

Primary author(s) : MOKHNENKO, Sergei; DERKACH, Denis (National Research University - Higher School of Economics); MAEVSKIY, Artem (Skobeltsyn Institute of Nuclear Physics (SINP MSU)); RATNIKOV, Fedor (NRU Higher School of Economics); ROGACHEV, Alexander

Presenter(s) : MOKHNENKO, Sergei; RATNIKOV, Fedor (NRU Higher School of Economics)

Session Classification : Facilities and Advanced Detector Technologies

Track Classification : Facilities and advanced detector technologies