ID de Contribution: **19** Type: **Non spécifié**

Quantum generative models for muonic force carriers events

vendredi 29 avril 2022 15:00 (15 minutes)

Generative models (GM) are promising applications for near-term quantum computers due to the probabilistic nature of quantum mechanics. In this work, we propose comparing a classical conditional generative adversarial network (C-GAN) approach with a Born machine while addressing their strengths and limitations to generate muonic force carriers (MFCs) events. The former uses a neural network as a discriminator to train the generator, while the latter takes advantage of the stochastic nature of measurements in quantum mechanics to generate samples. We consider a muon fixed-target collision between muons produced at the high-energy collisions of the LHC and the detector material of the ForwArd Search ExpeRiment (FASER) or the ATLAS calorimeter. In the ATLAS case, independent muon measurements performed by the inner detector (ID) and muon system (MS) can help observe new force carriers coupled to muons, which are usually not detected. In the FASER experiment, the high resolution of the tungsten/emulsion detector is used to measure the muons trajectories and energies. MFCs could potentially be part of dark matter (DM) and explain anomalies in the low-energy regime, making them attractive for physic searches beyond the standard model.

Auteurs principaux: KISS, Oriel Orphee Moira (CERN, UNIGE); Dr VALLECORSA, Sofia (CERN); Prof. KAJOMOVITZ, Enrique (Technion, Israel Institute of Technology); Dr GROSSI, Michele (CERN); M. RAMAZYAN, Tigran (National Research University Higher School of Economics, Moscow, Russia)

Orateur: KISS, Oriel Orphee Moira (CERN, UNIGE)

Classification de Session: AI and physics conference