Contribution ID: **204** Type: **Flashtalk with Poster**

Deep learning predicted elliptic flow of identified particles in heavy-ion collisions at the RHIC and LHC energies

Tuesday, 30 April 2024 18:11 (3 minutes)

Machine Learning (ML) techniques have been employed for the high energy physics (HEP) community since the early 80s to deal with a broad spectrum of problems. This work explores the prospects of using Deep Learning techniques to estimate elliptic flow (v2) in heavy-ion collisions at the RHIC and LHC energies. A novel method is developed to process the input
observables from track-level information. The proposed DNN model is trained with Pb-Pb collisions at √sNN=5.02 TeV minimum bias events simulated with AMPT model. The predictions from the ML technique are compared to both simulation and experiment. The Deep Learning model seems to preserve the centrality and energy dependence of v2 for the LHC and RHIC energies. The DNN model is also quite successful in predicting
the pT dependence of v2. When subjected to event simulation with additional noise, the proposed DNN model still keeps the robustness and prediction accuracy intact up to a reasonable extent.

Refs.: Phys.Rev.D 107 (2023) 9, 094001, Phys.Rev.D 105 (2022) 11, 114022

Primary author: BARNAFÖLDI, Gergely Gábor (HUN-REN Wigner RCP)

Presenter: BARNAFÖLDI, Gergely Gábor (HUN-REN Wigner RCP)

Session Classification: 3.3 Hardware acceleration, FPGAs & Uncertainty quantification

Track Classification: Session B