

XXV International Baldin Seminar on High Energy Physics Problems  
"Relativistic Nuclear Physics and Quantum Chromodynamics"



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## Generative machine learning approach for fast simulation of the Time Projection Chamber responses at the MPD detector

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With the increasing luminosity of modern accelerators in high energy physics, the problem of fast modelling of elementary particle detectors is becoming increasingly important. One approach to fast detector modelling is generative machine learning models, among them Generative adversarial networks (GANs) offer the fastest sampling.

This paper discusses the application of GANs to fast modelling the Time Projection Chamber (TPC) at the Multi-Purpose Detector (MPD) at the NICA accelerator complex. We will examine common challenges that arise during the process and explore potential solutions to address them.

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