Contribution ID: **145**   Type: **Oral**

Studies of space-charge distortion corrections using machine learning techniques

Wednesday 26 April 2023 16:40 (25 minutes)

A Large Ion Collider Experiment (ALICE) is an experiment at the Large Hadron Collider (LHC) which aims to understand the most basic properties of Quantum Chromodynamics (QCD) by observing Quark-Gluon Plasma (QGP) created at the center of relativistic heavy-ion collisions. The ALICE detector has been largely upgraded during the LHC Long Shutdown LS2 to become capable of collecting Pb-Pb collision data at an unprecedented interaction rate of 50 kHz. The Time Projection Chamber (TPC) is the main tracking detector of ALICE. Distortions of the electron drift paths caused by ion backflow from the readout chambers significantly affect the TPC measurements and therefore must be fully corrected. The most challenging aspect of the correction is posed by the calibration of distortion fluctuations relevant on time scales in the order of 10 ms. A framework for the distortion fluctuation correction using machine learning techniques is under development and the current status will be discussed.

Theory / experiment

Experiment

Group or collaboration name

ALICE

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Session Classification: Parallel Session B

Track Classification: Experimental techniques and future programs