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Detector response simulation of the ALICE TPC

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The ALICE Time Projection Chamber (TPC) is the main tracking and particle identification (PID) detector of ALICE at the CERN-LHC. It was designed for multiplicities of up to 20,000 primary and secondary charged particles emerging from a single central Pb-Pb collision. The PID in the TPC is calculated from the specific energy loss measurement (dE/dx), which is derived from the pulse height distribution of charged particle tracks.

Accurate simulation of the dE/dx response of the TPC plays a significant role in the testing of the reconstruction and analysis algorithms, in particular in the high multiplicity environment of Pb-Pb collisions, and eventually in the quality of the final physics results of ALICE. In this presentation, a novel approach for the detector response simulation of the TPC and its impact on the PID performance will be presented.

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