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TPOT : Micromegas detectors to reconstruct distortions of the sPHENIX TPC

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The sPHENIX detector is being constructed at the Relativistic Heavy Ion Collider (RHIC) at the Brookhaven National Laboratory in the USA. It will be commissioned for data taking in 2023. It will focus on measuring jets as well as open and hidden heavy flavor production in heavy ion collisions to study the properties of the Quark Gluon Plasma. The tracking of the sPHENIX apparatus is built around a TPC which needs a robust and efficient calibration. In particular, the distortions of the electrons drift in the sPHENIX TPC (the main tracking device of the experiment) due to imperfect field and space charge effects, must be accurately measured and corrected. The TPC Outer Tracker (TPOT) is a new detector subsystem that will be installed on the outside of the TPC and will greatly facilitate measuring the electron drift distortions in the TPC. The TPOT consists of 8 double layers Micromegas which provide an additional space point on the outside of the TPC in a limited fraction of its acceptance. This talk will cover the description of the TPOT, the Micromegas design and then the production which lasted a period of 4 months at Saclay. Then the performances of the detectors with cosmic rays and the integration of the detectors within the sPHENIX will be shown.

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