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## A Micromegas detector to reconstruct space charge distortions in 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. 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. To achieve its physics program sPHENIX needs a robust and efficient calibration of its constituting detectors. In particular, the distortions of the electrons drift in the sPHENIX TPC (the main tracking device of the experiment) due to magnetic 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, in addition to the other existing solutions in sPHENIX. In particular it will allow to make the maximum use of tracks to reconstruct beam-induced space charge distortions and monitor the electron drift velocity. The subsystem consists of 16 Micromegas detectors grouped two-by-two to provide an additional space point on the outside of the TPC in a limited fraction of its acceptance. This poster will discuss the technology used for the Micromegas detectors, the performances of the first detector prototypes, the configuration adopted for the TPOT subsystem, how the subsystem fits into the overall strategy for reconstructing the TPC distortions as well as progress in the construction of the detector itself.

**Presenter:** FRANCISCO, Audrey (CEA)

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