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THE GEM QA PROTOCOL OF THE ALICE TPC UPGRADE PROJECT

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The ALICE experiment at the Large Hadron Collider at CERN is upgrading its central tracking detector, the Time Projection Chamber (TPC). The installation is foreseen during the second long shutdown of the Large Hadron Collider. The upgrade includes the complete exchange of the present MWPC readout chambers (ROC) with new ones based on Gas Electron Multiplier detectors. This is necessary due to the higher LHC luminosity and thus higher interaction rate. The new ROCs allow for continuous readout at 50 kHz compared to 500 Hz of the gated MWPC readout, while maintaining the particle identification capability of the present system.

During the R&D phase of the upgrade activities a baseline configuration was developed to simultaneously fulfill strict the design criteria on energy resolution, ion back flow and operational stability. The solution consists of a stack of four GEM foils each operated at a specific electric field configuration.

A thorough quality assurance scheme was developed to build reliable TPC ROCs. Moreover the collaboration has established a strict QA protocol to ensure that the production of the ROCs, which are distributed over several institutes in two continents, does not compromise the high quality standards.

The QA consists of two stages, the basic QA done close to the GEM production workshop at CERN and the advanced QA done at dedicated QA centers. Full traceability of detector components will be maintained throughout the process. A detailed description of the QA protocol will be given with emphasis on the high definition optical scanning and gain measurements of individual GEM foils.

The production of the new ALICE TPC ROCs has finally started. First QA experience under production conditions and workload will be presented.

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Session Classification: Coffee Break and Poster Session - 2