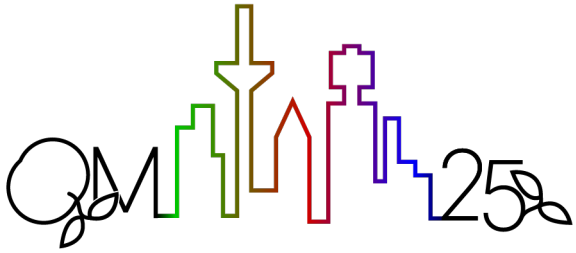

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Charged particles tracking in heavy ion collisions for ATLAS in Run 4

LHC Run 4 will provide additional challenges in the already demanding field of charged particle track reconstruction. The Inner Detector of the ATLAS experiment will be replaced by an all-silicon inner tracker (ITk) that will consist of Pixels and Strips providing greater coverage in pseudorapidity spanning up to 8 units. The ACTS Common Tracking Software (ACTS) is the toolkit of choice that will be used to perform track reconstruction, and it is expected to meet the new challenges. The physics of heavy ions (HI) requires a different tracking setup as compared to *pp* collisions. This is dictated by the difference in experimental conditions, where instead of a huge pile-up of 200 parasitic interactions per crossing in *pp* collisions, the HI physics expects only one collision per bunch crossing. Despite this, a central lead ion collision produces a comparable number of tracks as to *pp* collisions. The single vertex of the collision allows for optimizations and in other aspects makes the task more challenging. The poster discusses the progress in setting up the ACTS based track reconstruction for HI in the ITk, shows a comparison between *pp* and HI tracking performances, and presents the predicted performance of ACTS compared to the existing tracking algorithms used by ATLAS.

Category

Experiment

Collaboration (if applicable)

ATLAS Collaboration

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