

Towards Validating Misalignment Measurements of Small-Strip Thin Gap Chamber Quadruplets for the ATLAS New Small Wheel

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The small wheels of the end-caps of the ATLAS muon spectrometer must be replaced to improve the angular resolution of tracks for precision muon momentum reconstruction during Run-3. The New Small Wheel (NSW) will be covered with two detector technologies, one of which is small-strip thin gap chambers (sTGCs). Canada is responsible for one quarter of the required sTGCs: the electrode boards are prepared at TRIUMF; sTGCs are constructed at Carleton University and four sTGCs are glued into a quadruplet; the quadruplets are tested at McGill University using a cosmic ray hodoscope; and finally the quadruplets are sent to CERN for integration into the NSW. The strip electrode layers of each sTGC in a quadruplet have 3.2 mm pitch, chosen so that they can achieve 1 mrad angular resolution on tracks. However, misalignments between a quadruplet's strip layers introduced during construction must be corrected for. The charge profile left by an x-ray gun on quadruplets and coordinate measuring machine (CMM) measurements of individual strip layers are being used to define these parameters. Work on using cosmic ray data to validate misalignment parameters derived using the above-mentioned methods will be presented.

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Please select: Experiment or Theory

Instrumentation

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