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Assembly and Testing of ATLAS ITk pixel detector modules

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The ATLAS detector will be upgraded to cope with challenging new conditions at the HL-LHC. The upgrades will include extended geometric coverage and finer detector resolution. The success of the research programs at the HL-LHC will strongly rely on tracking performance. Reconstructing individual particles in the HL-LHC collision environment with thousands of charged particles being produced within a few cm will be very challenging. The entire tracking system, presently consisting of pixel and strip detectors and the transition radiation tracker, will be replaced by a new all-silicon pixel and strip tracker. This excellent tracking detector will enable full exploitation of the physics potential of the LHC dataset in the HL-LHC era. The Argonne National Laboratory (ANL) is tasked with the testing and assembly of the inner tracker (ITk) pixel Layer1 quad module for the ATLAS detector upgrade. In the next 2-3 years, approximately 1200 silicon pixel modules will be assembled and tested at the laboratory. This presentation discusses the readiness of the preproduction and production of the ITk pixel Layer1 quad module highlighting the innovative test setup at ANL, designed to handle the fast production rate. Finally, a comprehensive and meticulously planned assembly and testing procedure is presented.

Mini Symposia (Invited Talks Only)

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