

Automated Assembly of Larger Detector Structures for the ATLAS New Inner Tracker

The ATLAS experiment is currently preparing for the HL-LHC upgrade, with an all-silicon Inner Tracker (ITk) that will replace the current Inner Detector. The ITk will feature a pixel detector surrounded by a strip detector, with the strip system consisting of 4 barrel layers and 6 endcap disks. The strip tracker will consist of 11,000 silicon sensor modules in the central region and 7,000 modules in the end-cap region, which are mounted onto larger carbon-fibre support structures called 'petals' for the end-cap and 'staves' for the barrel. To facilitate the assembly of these larger detector structures, an automated system has been developed for mounting modules on petals. The automated procedure streamlines and simplifies the production process and ensures uniformity across the four international production clusters. The system utilizes advanced robotic technology to mount the modules on petal cores and reduce the potential for operational error while increasing throughput. This contribution summarizes the latest results from the assembly of the first ATLAS ITk pre-production petals earlier this year.

Submission declaration

Original and unpublished

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Track Classification: Detector concepts