

# Testbeam studies of ATLAS ITk strip modules at DESY-II testbeam facility

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In order to cope with the occupancy and radiation doses expected at the HL-LHC, the ATLAS experiment will replace its Inner Detector with an all-silicon Inner Tracker (ITk). The ITk strip subsystem will be built from modules, consisting of one n<sup>+</sup>-in-p silicon sensor, one or two PCB hybrids with the front-end electronics, and one powerboard. To validate the detector performance, a series of testbeams has been performed at the DESY-II facility with modules before and after irradiation. Tracking was provided by EUDET telescopes, consisting of six Mimosas26 pixel planes, with an additional plane used to improve the timing resolution.

This contribution summarizes the main results, including tracking performance, charge collection, efficiency, and noise occupancy. Detailed studies of sensor features are also performed. Finally, the measurements are compared to simulations made with Allpix2. The results give confidence that the ITk strip detector will meet the requirements of the HL-LHC.

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