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Test beam performance of pixel detectors for the Inner Tracker Upgrade of the ATLAS experiment

During the high luminosity phase of the Large Hadron Collider (HL-LHC) up to 200 proton-proton interactions per bunch crossing will be produced. The inner detector of the ATLAS experiment will be completely replaced with a new Inner Tracker (ITk) to cope with the resulting harsher environment.
The pixel detector, located in the innermost part of the ITk, will be subject to radiation fluences up to $2 \cdot 10^{16}\ n_{eq}/cm^2$. The ITk pixel detector will be instrumented with different detector technologies depending on the distance and position from the interaction point, to withstand the expected fluences and deal with the expected extremely large particle multiplicity. n-in-p planar and 3D sensors with different thickness and pixel size will be used, whose production is carried out by different vendors and institutes.
All combinations of sensor type and vendor are being characterized as soon as they are available with test beam campaigns to assess their performance, both before and after irradiation. An overview of the current test beam results will be given.

Submission declaration

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Author: KRAUSE, Christopher (Technische Universitaet Dortmund (DE))

Presenter: KRAUSE, Christopher (Technische Universitaet Dortmund (DE))

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