Contribution ID: **19** Type: **Talk**

Qualification of pixel detectors for the upgrade of the ATLAS Inner Detector with beams tests

Friday, April 19, 2024 9:40 AM (20 minutes)

The ATLAS Inner Detector will be completely replaced with an all-silicon Inner Tracker (ITk) to withstand the harsh operational conditions of the High Luminosity LHC at CERN.
The ITk pixel detector will be located in the innermost part of the ITk. It will be instrumented with different sensor technologies according to the expected total fluence, which ranges up to $1.9 \cdot 10^{16}$ n_{eq}/cm^2 (safety factor of 1.5 included), and the required performance. Pixel sensors with 3D technology will instrument the innermost layer (L0), planar n-in-p sensors 100 µm and 150 µm thick will instrument respectively the second innermost layer (L1) and the outer layers (L2-L4). Additionally, planar sensors will have a pixel size of 50x50 μm^2, while 3D sensors with pixel size of 50×50 μm^2 and 25×100 μm^2 will be used. Eventually, the production and hybridization of pixel detectors is distributed across several vendors and institutes.
A large effort to study the variety of pre-production pixel detectors with different technology, design, and produced by different vendors is ongoing. An overview of the results obtained with beam tests and the progress of the beam test setup is given.

Primary author: CARLOTTO, Juan Ignacio (IFAE - Barcelona (ES))

Co-author: RESSEGOTTI, Martina (INFN e Universita Genova (IT))

Presenter: CARLOTTO, Juan Ignacio (IFAE - Barcelona (ES))

Session Classification: Test beam analysis