Contribution ID: **12**   Type: **contributed talk**

LPNHE - FBK thin n-on-p pixels for HL-LHC upgrades and beyond

Monday 17 February 2020 15:15 (20 minutes)

In view of the LHC upgrade phases towards the High Luminosity LHC (HL-LHC), the ATLAS experiment plans to upgrade the Inner Detector with an all-silicon system.
The n-on-p silicon technology is a promising candidate to achieve a large area instrumented with pixel sensors, since it is radiation hard and cost effective.
The paper reports on the performance of LPNHE thin n-on-p planar pixel sensors produced at FBK-CMM; the sensors were bump-bonded to the RD53A prototype chip, featuring a 50x50 um^2 pixel cell.
After discussing the sensor technology an overview of 2019 testbeam results of the produced devices will be given, before and after irradiation, including cluster properties, hit efficiency and space resolution.
Results for new 50 um thick n-on-p pixel sensors, still produced by LPNHE at FBK-CMM and bump-bonded to the RD53A prototype chip, will be presented too.
These very thin modules are attractive for detectors at future high luminosity and high energy machines where the lowest possible material budget is required to achieve the best tracking and vertexing resolution.

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Session Classification: Planar Pixel R&D

Track Classification: Planar sensors