



Contribution ID: 98

Type: **Poster contribution**

Development and test of Thin, Narrow-Pitch 3D Pixel Sensors for HL-LHC

Friday, April 21, 2017 5:00 PM (1 hour)

During the 2024-2025 shutdown, the Large Hadron Collider (LHC) will be upgraded to reach an instantaneous luminosity of up to $7 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$ (phase-2 upgrade). ATLAS and CMS detectors will be deeply renewed to meet the new challenges: an average of 200 pile-up events in every bunch crossing and an integrated luminosity of 3000-4000 fb^{-1} over ten years or more. A first batch of new 3D pixel sensors oriented to the Phase 2 Upgrade was fabricated at FBK Trento on 6" Si-Si Direct Wafer Bonded substrates. These sensors have increased pixel granularity (e.g., 50×50 or $25 \times 100 \mu\text{m}^2$ pixel size), thinner active layer ($\sim 100 \mu\text{m}$) with columnar electrodes having narrower size ($\sim 5 \mu\text{m}$) and reduced spacing ($\sim 30 \mu\text{m}$), as required for high radiation hardness (up to a fluence of $2 \times 10^{16} \text{ neq cm}^{-2}$). In this contribution we present laboratory measurements, such as IV curves and charge collection using radioactive sources and laser setup, and also preliminary measurements of efficiency and charge collection from a test beam at the Cern SPS. An overview of the technological and design aspects relevant to the fabrication of the second batch, funded by the AIDA- 2020 project, will be also presented.

Primary author: Mr MENDICINO ON BEHALF OF THE INFN-FBK PHASE2 COLLABORATION., Roberto (TIFPA)

Presenter: Mr MENDICINO ON BEHALF OF THE INFN-FBK PHASE2 COLLABORATION., Roberto (TIFPA)

Session Classification: Archivio Poster

Track Classification: Sessione Nuove Tecnologie