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

*Friday, 21 April 2017 17:00 (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<sup>-1</sup> 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.,  $50 \times 50$  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.

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