Contribution ID: **146** Type: **Poster**

Development of a New Generation of 3D Pixel Sensors for HL-LHC

Thursday, 28 May 2015 09:13 (0 minutes)

We report on the development of a new generation of 3D pixel sensors for the High-Luminosity LHC (HL-LHC) within the framework of the INFN-FBK "Phase 2"R&D program. In the first year of the project, the sensor technology and design have been optimized for increased pixel granularity (e.g., 25x100 or 50x50 um^2 pixel size), extreme radiation hardness (up to a fluence of 2x10^16 neq cm^-2), reduced material budget and better geometrical efficiency. Compared to the double-sided 3D sensors successfully produced at FBK for the ATLAS IBL, these requirements called for a modified (single-sided) technology allowing for thinner sensors (~100 um), narrower electrodes (~ 5 um), reduced electrode spacing (~ 30 um), and very slim (~ 50 um) or active edges. Moreover, pixel designs compatible both with present (for testing) and future (RD53 65- nm CMOS) read-out chips of ATLAS and CMS are necessary.
The paper will cover aspects relevant to the main technological steps being developed (e.g., Deep Reactive Ion Etching of narrow columnar electrodes and filling of the same with poly-Si) and to the design, TCAD simulation and layout of the first batch of these new 3D sensors to be fabricated at FBK on 6-inch wafers.

Collaboration

On behalf of the ACTIVE (Atlas and Cms Towards InnovatiVe pixEls) Collaboration.

Primary author: Prof. DALLA BETTA, Gian Franco (University of Trento)

Presenter: Mr BOSCARDIN, Maurizio (FBK)

Session Classification: Solid State Detectors - Poster Session

Track Classification: S6 - Solid State Detectors