Contribution ID: **143** Type: **Oral**

Performance of irradiated FBK 3D sensors for the ATLAS ITk pixel detector

Thursday 18 February 2021 14:00 (20 minutes)

3D pixel sensors will be used for the innermost layer (L0) of the ATLAS ITk detector at High Luminosity LHC. The pixel size will be either 25 µm x 100 µm (barrel, central part of L0) or 50 µm x 50 µm (endcap, lateral rings). Sensor wafers with 150 µm active thickness have been produced by FBK in collaboration with INFN. Several sensors were bump bonded to RD53A read-out chips at Leonardo and tested in laboratory and at DESY beam line. In this talk, we report on the test beam characterization in terms of hit efficiency and charge collection of two modules (25µ µm x 100 µm and 50 µm x 50 µm) irradiated with 27 MeV protons up to a fluence of 1.0e16 1 MeV n_{eq} cm^{-2}. Moreover, leakage current and power dissipation of 3D diodes after 1.0 and 1.5e16 1 MeV n_{eq} cm^{-2} irradiaton with neutrons is shown. Finally, the preparation work for the assembly of endcap L0 modules in INFN Genoa is presented.

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Session Classification: Session 11: 3D Sensors

Track Classification: 3D Sensors