Contribution ID: **153**   Type: **Talk**

LGAD Sensors and their Applications, an Overview from FBK

Thursday 20 February 2025 14:00 (20 minutes)

Low Gain Avalanche Diodes (LGADs) are silicon sensors employing charge multiplication to achieve a charge gain in the order of 10. The initial development of these sensors was spur by the High Luminosity upgrade of the Large Hadron Collider (HL-LHC), where these sensors will be used to measure the time of arrival of minimum ionizing particles with a precision of about 30 ps. To achieve this performance, LGADs improve the signal-to-noise ratio (SNR) of the detector system due to their gain and have been engineered to withstand the harsh radiation environment of the HL-LHC experiments. A feature of the first implementation of LGADs is the presence of areas without gain between the readout channels, reducing the fill factor of the devices. Different technological solutions were explored to improve the LGAD fill factor, resulting in different sensor structures. Due to their time resolution for charged particles and improved SNR, LGAD sensors are finding applications outside high energy physics. FBK is active in the development of LGAD sensors and has accumulated experience with these sensors through the fabrication of several sensor batches. The features of different LGAD structures are summarized in this talk together with selected examples of the applications of LGAD sensors and their performances.

Primary experiment

Authors: BISHT, Ashish; BOSCARDIN, Maurizio (FBK Trento); CAVAZZINI, Leo; CENTIS VIGNALI, Matteo (FBK); FICORELLA, Francesco (Fondazione Bruno Kessler); HAMMAD ALI, Omar; PATERNOSTER, Giovanni (Fondazione Bruno KEssler)

Presenter: CENTIS VIGNALI, Matteo (FBK)

Session Classification: Semiconductor LGAD 1

Track Classification: LGAD