



Contribution ID: 14

Type: **contributed talk**

## R&D on LGAD Radiation Tolerance for HL-LHC

*Tuesday, 18 February 2020 17:40 (20 minutes)*

Low Gain Avalanche Detectors (LGADs) are silicon detectors with modest internal gain (up to  $\sim 50$ ) that allows the sensor to be very thin (20-50  $\mu\text{m}$ ). LGADs are characterized by an extremely good time resolution (down to 17ps), a fast rise time ( $\sim 500\text{ps}$ ) and a very high repetition rate ( $\sim 1\text{ns}$  full charge collection). These devices are relatively new but will be perfect candidates in a number of application in the future thanks to their proprieties. The first application will be with the ATLAS and CMS timing layers at the LHC where they will be utilized to mitigate the high pileup environment of High Luminosity LHC (HL-LHC) thanks to the extraordinary time resolution.

A current challenge is to produce LGADs with sufficient radiation hardness to withstand fluences up to  $3\text{E}15$   $\text{Neq}/\text{cm}^2$  which is the level required for the HL-LHC environment. We'll report on the results of a radiation campaign with neutrons and protons up to a fluence of  $3\text{E}15$   $\text{Neq}/\text{cm}^2$  of LGAD sensors produced by HPK and FBK.

**Primary authors:** SEIDEN, Abraham (University of California,Santa Cruz (US)); Prof. SCHUMM, Bruce Andrew (University of California,Santa Cruz (US)); GEE, Carolyn (University of California,Santa Cruz (US)); SADROZINSKI, Hartmut (SCIPP, UC santa Cruz); PADILLA, Rene (UC Santa Cruz); ZHAO, Yuzhan (University of California Santa Cruz); GALLOWAY, Zachary; MAZZA, Simone Michele (University of California,Santa Cruz (US))

**Presenter:** MAZZA, Simone Michele (University of California,Santa Cruz (US))

**Session Classification:** Radiation and High Fluence

**Track Classification:** hybrid sensors (3D, LGAD)