Abstract Submitted
for the APR20 Meeting of
The American Physical Society

Characterization of Irradiated Silicon Sensors for HGCAL TIELIGE MENGKE, TIMO PELTOLA, NURAL AKCHURIN, VLADIMIR KURYATKOV, ZHIXING WANG, Texas Tech Univ, CMS COLLABORATION[1] — As part of High Luminosity LHC (HL-LHC) project, the high-granularity calorimeter (HGCAL) will be a major upgrade of CMS experiment to replace the current endcap calorimeter. Due to the higher instantaneous luminosity of the HL-LHC and the rapidity range the HGCAL will cover, radiation tolerance is a primary design consideration. The majority of the HGCAL will be based on 120-, 200-, and 300 m thick silicon (Si) pad sensors and will sustain 1-MeV neutron equivalent fluences up to about 10ˆ16 neqcmˆ{-2}. Campaigns have been underway to determine the level of degradation expected over the full life of the detector. A first study of irradiated test diode samples from 8-inch and 6-inch wafers at -30 C is presented, including all three thicknesses and both bulk polarities. The electrical and charge collection properties are characterized after irradiation by current-voltage, capacitance-voltage and infrared Transient Current Technique measurements for sensors exposed to various fluence levels.

[1]The Compact Muon Solenoid (CMS) experiment at CERN

Tielige Mengke
Texas Tech Univ

Date submitted: 12 Jan 2020 Electronic form version 1.4