Contribution ID: **88** Type: **not specified**

A SiPM-based optical readout system for the EIC dual-radiator RICH

Tuesday, 18 October 2022 14:40 (5 minutes)

Silicon photomultipliers (SiPM) are candidates selected as the potential photodetector technology for the dual-radiator Ring-Imaging Cherenkov (dRICH) detector at the future Electron-Ion Collider (EIC). SiPM optical readout offers several advantages being cheap, highly efficient and insensitive to the high magnetic field (~ 1.5 T) expected at the sensor plane in the experiment. On the other hand, SiPM are not radiation tolerant and despite the moderate integrated radiation level (< 10^{11} 1-MeV neq/cm2), single photon-counting capabilities and the Dark Count Rate (DCR) must be kept under control to maintain the optimal dRICH detector performance across the years. Several options are available to maintain the DCR to an acceptable rate (below ~100 kHz/mm2), namely by reducing the SiPM operating temperature and by recovering the radiation damage with high-temperature annealing cycles.

Presenter: RIGNANESE, Luigi Pio (Istituto Nazionale di Fisica Nucleare)

Session Classification: Photon Detectors