

## **Monitoring Radiation Damages of the Silicon Photomultipliers (SiPMs) used as readouts for the Forward Calorimeter System at STAR.**

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The STAR detector at RHIC, BNL is currently undergoing an upgrade with a new calorimeter system and a tracking system in the forward  $2.5 < \eta < 4$  rapidity region. This upgrade is mainly driven to explore QCD physics in the high or low region of  $x$ . The Forward Calorimeter System (FCS) consists of the refurbished PHENIX Shashlyk Lead Scintillator (Pb/Sc) Electromagnetic Calorimeter (EMCal) followed by an iron and scintillator (Fe/Sc) sampling Hadronic Calorimeter (HCal). The readout for both these calorimeters are fast and compact silicon photomultipliers (SiPMs). This study is dedicated to the monitoring of radiation damage to the SiPMs. Such damage would lead to an increase in the leakage currents over time, resulting in increased noise in the SiPMs. This would degrade the performance of the detector and might require a change in the bias setting on SiPMs to preserve linearity. This monitoring tool also is essential for identifying bad SiPMs/FEE cards and replacing them. Finally, it acts as a good feedback to the accelerator for tuning the beam conditions in cases of abnormal leakage current patterns during runs. A comparison with radiation damage seen in previous runs will also be presented.