

## Evaluation of Radiation Effects on VUV-MPPC caused by VUV light

*Thursday, 28 May 2020 16:54 (18 minutes)*

This study aimed to evaluate the effect of radiation damage on a VUV-MPPC caused by VUV light.

We observed PDE degradation of VUV-MPPCs installed in liquid xenon  $\gamma$  detector for the MEG experiment under  $\mu$  beam. One possible cause can be a surface damage at Si-SiO<sub>2</sub> interface. The electric field near the interface can be reduced by accumulated holes from the ionization of incident particles.

The VUV-MPPC was irradiated using a xenon lamp at room temperature. Relative PDE for VUV light was monitored using a xenon lamp with bandpass filters to select VUV light. The PDE for VUV light decreased during the irradiation and saturated at about 30% at the dose level of about  $10^{16}$  photons/mm<sup>2</sup> with wavelength of 180 nm.

Annealing is supposed to be effective to recover PDE because the accumulate holes can be removed at high temperature. In order to see the effect, we performed annealing of the irradiated VUV-MPPC. As a result, the recovery of PDE was observed.

### Funding information

**Primary authors:** ONDA, Rina (University of Tokyo); IEKI, Kei (University of Tokyo (JP)); IWAMOTO, Toshiyuki (ICEPP); KOBAYASHI, Satoru (University of Tokyo); MORI, T (ICEPP); OGAWA, Shinji (The University of Tokyo); OOTANI, Wataru (ICEPP, University of Tokyo); SHIMADA, K (University of Tokyo); TOYODA, K (University of Tokyo)

**Presenter:** ONDA, Rina (University of Tokyo)

**Session Classification:** Sensors: Photo-detectors

**Track Classification:** Sensors: Photo-detectors