



Contribution ID: 189

Type: Poster

## Upgrade of Liquid xenon gamma-ray detector in MEG experiment

In the MEG experiment, we are searching for the lepton flavor violating decay,  $\mu \rightarrow e + \gamma$ , with the highest sensitivity. We have recently published the current tightest upper limit of the branching ratio of  $2.4 \times 10^{-12}$ , and aim at reaching a sensitivity of  $6 \times 10^{-13}$  in 2013 as the goal of the current phase of the experiment.

We are planning a major upgrade of the experiment including an upgrade of the liquid xenon (LXe) gamma-ray detector. The current 2-inch photomultiplier tubes on the gamma-ray incident face will be replaced with smaller photo-sensors such as MPPCs in order to significantly improve the resolutions and efficiency. The improved performance of the LXe detector would help to greatly reduce the background and thus to improve the sensitivity of the experiment.

A MPPC operational in LXe is under development in collaboration with Hamamatsu Photonics. One of the difficulties is that the commercial MPPC is not sensitive to the LXe scintillation light in VUV region. We are improving the UV-sensitivity by modifying the parameters of the MPPCs and recently succeeded to detect the scintillation light with the first prototypes.

The design concept and the expected performance of the upgraded LXe detector will be described. The status and plan of the RD of the upgraded detector will also be presented placing emphasis on the development of the UV-enhanced MPPC.

### quote your primary experiment

MEG experiment

**Primary author:** KANEKO, Daisuke (Univ. of Tokyo)

**Presenter:** KANEKO, Daisuke (Univ. of Tokyo)

**Track Classification:** Electronics