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Large Scale Characterization of SiPMs in the MEG II Experiment

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The upgrade of the MEG experiment, called MEG II, highly relies on the application of SiPMs. Two main detectors use a large amount of SiPMs for highly granular readouts of scintillation light. The Timing Counter uses 6144 NUV-type SiPMs from AdvanSiD. We tested all the sensors before the assembly with respect to I-V characteristics and sensitivity to the scintillation light. During the experiment, the performance and the radiation damage level have been monitored using a dedicated laser system as well as the sensor currents. The LXe detector uses 4092 VUV-type SiPMs from Hamamatsu Photonics. One device is composed of independent 4 sensor chips, totaling 16,368 chips, and all of them were tested individually at room temperature before the assembly for the full characterization. During the experiment, the SiPM characteristics, such as gain and PDE, have been monitored and calibrated by means of alpha sources and LEDs in the detector. In this talk, we will present the methods and results.

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