

# Detection of low-energy X-rays with 1/2 and 1 inch LaBr<sub>3</sub>:Ce crystals read by SiPM arrays

*Tuesday, May 25, 2021 5:12 AM (18 minutes)*

LaBr<sub>3</sub>:Ce crystals are used for radiation imaging in medical physics, with PMT or SiPM readout. A R&D was pursued with 1/2 and 1" crystals to realize compact large area detectors (up to some cm<sup>2</sup> area) with SiPM array readout, aiming at high light yields, good energy resolution/linearity and fast time response for low-energy X-rays. The study was triggered by the FAMU experiment at RIKEN-RAL  $\mu$  facility. The goal is the detection of characteristic X-rays around 130 KeV. Other applications may be foreseen in medical physics, such as PET and gamma-ray astronomy. A direct readout, employing CAEN V1730 FADCs, better suited for applications, was used. The temperature gain drift of SiPM was controlled by custom NIM modules, based on CAEN A7585D power supply chips. Laboratory test results will be reported. As an example, at the Cs<sup>137</sup> peak, an energy resolution up to ~3 % was obtained, with Hamamatsu S14161 array SiPM. This compares well with best results obtained with PMT readout.

## TIPP2020 abstract resubmission?

No, this is an entirely new submission.

## Funding information

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**Session Classification:** Sensor Posters: Light-based Detectors

**Track Classification:** Sensors: Sensors: Light-based detectors