



Contribution ID: 249

Type: Poster

Characterization of Pr:LuAG scintillating crystals for X-ray spectroscopy

Tuesday, 26 May 2015 15:28 (0 minutes)

The main features of the Pr doped $\text{Lu}_3\text{Al}_5\text{O}_{12}$ (Pr:LuAG) scintillating crystals for X-ray spectroscopy applications have been studied using different radioactive sources and photo-detectors. Pr:LuAG is cheaper, compared to a Germanium detector, but with remarkable properties which make it useful for many applications, from fundamental physics measurements to the PET imaging for medical purposes: high density, elevate light yield, fast response, high energy resolution, no hygroscopicity.

A sample of Pr:LuAG crystals with $0.5'' \times 0.5''$ surface area and 13 mm thickness and a NaI crystal of the same surface and 26 mm thickness used as a reference have been characterized with several radioactive sources, emitting photons in the range $100 \div 1000$ keV. Different light detectors were adopted for the Pr:LuAG studies, sensitive to its UV emission (peak at 310 nm): a 3'' PMT (Hamamatsu R11065) and new arrays of Hamamatsu SiPM, with siliconic resin as a window. Results are presented on the performance of the Pr:LuAG crystals, to be mounted in a 2×2 array to be tested in the 2015 run of the FAMU experiment at RIKEN-RAL muon facility. The goal is the detection of the X-rays (around 130 keV) emitted during the de-excitation processes of the muonic hydrogen after the excitation with an IR laser with wavelength set at the resonance of the hyperfine splitting, to measure the muonic atom proton radius with unprecedented precision.

Primary authors: DE BARI, Antonio (PV); ROSSELLA, Massimo (PV); BONESINI, Maurizio Giorgio (MIB)

Co-authors: MENEGOLLI, Alessandro (PV); FALCONE, Andrea (PV); CLEMENZA, Massimiliano (MIB); Dr NASTASI, Massimiliano (MIB); BERTONI, Roberto (MIB); MAZZA, Roberto (MIB)

Presenter: ROSSELLA, Massimo (PV)

Session Classification: Applications - Poster Session

Track Classification: S4 - Applications