

# The LYSO scintillation light measurement with an ultra-fast MCP-PMT

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The scintillator can be seen as a wavelength shifter which converts the incident particle into a number of photons. The decay time of scintillators is measured by coupling the scintillation with the photosensitive device. Through the scintillation light waveform sampling and the decay time exponential fitting, we can obtain the decay time of the scintillation. Traditionally the photosensitive device used to measure the scintillation light have a rise time on the order of ns. In our experiment, an ultra-fast MCP-PMT with a rise time of 100 ps and a transit time spread of 46 ps at single-photon mode was used to be coupled with the Lu<sub>1.8</sub>Y<sub>2</sub>SiO<sub>5</sub>:Ce (LYSO) scintillator and obtain the scintillation light waveforms. The waveform obtained is not a complete scintillation pulse, the photons in one scintillation event are distinguished and becomes discrete pulses. The results will show the intrinsic decay time of the LYSO and may be an experimental prove of some scintillator luminescence theory.

## TIPP2020 abstract resubmission?

No, this is an entirely new submission.

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