

# Study of H-8500 MaPMT for the FDIRC



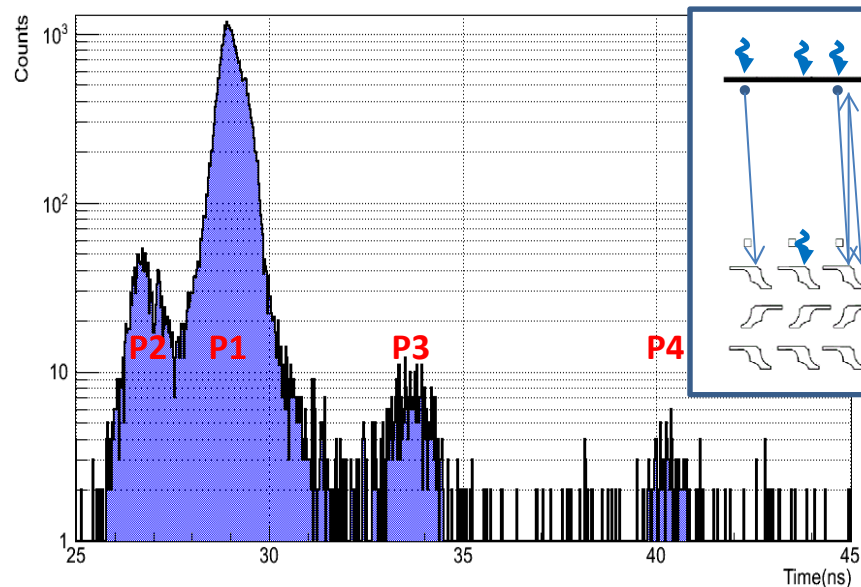
## detector at SuperB

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An overview of studies on the Hamamatsu H-8500 Multi-Anode Photomultiplier (MaPMT) is presented. The device will be used for the FDIRC Particle Identification detector of the SuperB experiment

### Transit Time (TT) distribution



Source: focused laser beam @ 405nm

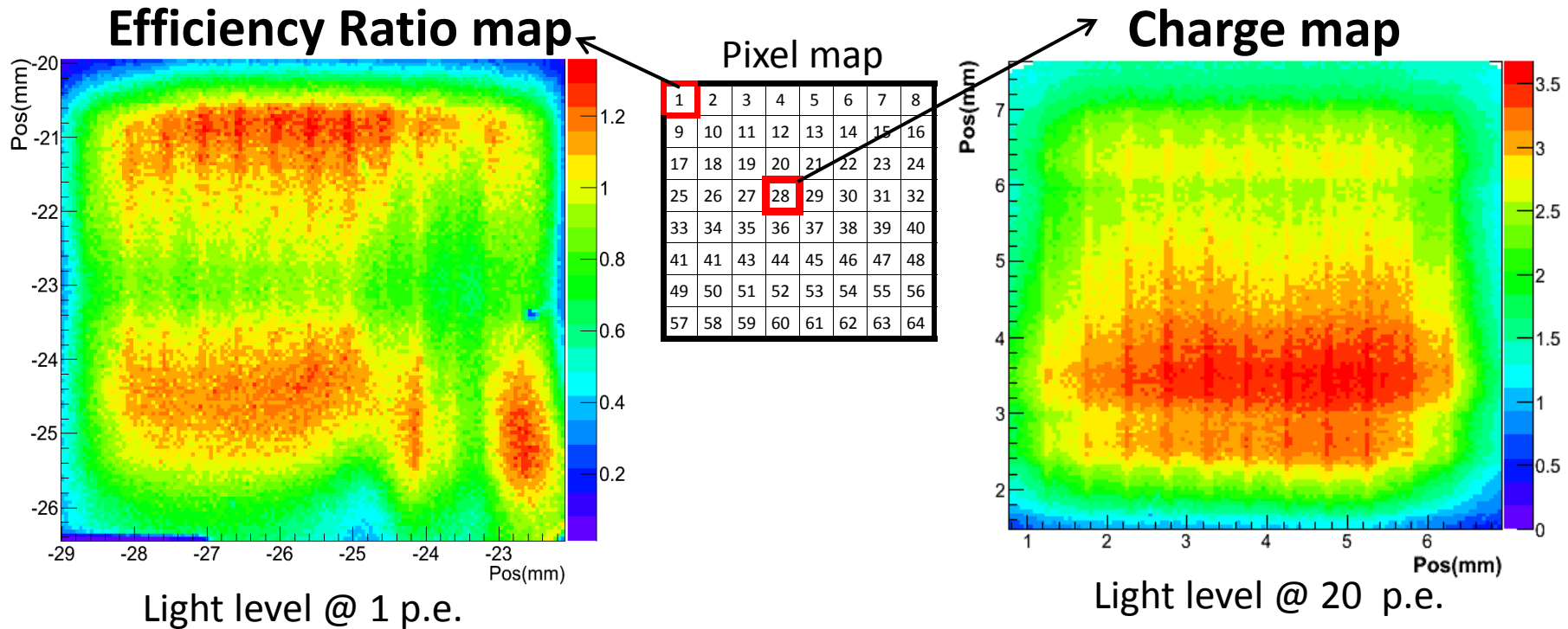
**P1:** Photons convert at photocathode and p.e. are multiplied across all the 12 dynodes.

**P2:** Photons convert at the 1<sup>st</sup> dynode and p.e. are multiplied across 11 dynodes. These p.e. are characterized by a shorter TT (-2.4ns) and a lower gain.

**P3 and P4:** Photons convert at the photocathode but the p.e. is back scattered at the 1<sup>st</sup> dynode and then it moves again towards the 1<sup>st</sup> dynode. These p.e. are characterized by a longer TT (+4.6ns and +11.6ns).

The measured Transit Time Spread depends on the laser beam position on the photocathode and its mean value is measured to be **160-200ps**.

# Gain and efficiency



The map shows the ratio between H-8500 and Photonis XP2020 (reference) detection efficiency: the variation inside the pixel is roughly 50%. The increase in efficiency is also evident near the focusing electrodes.

The measured gain variation is around 50%. The vertical lines in the map correspond to a gain increase of 5% around the focusing electrodes.