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The UV sensitivity improvement of MPPC

MPPC (Multi-Pixel Photon Counter) is the kind of solid state photon counting device operating in geiger-mode. The features of the MPPC is the high gain (up to 10^5 to 10^6), high time resolution and high sensitivity around 400-500nm. These characteristics are well matched to the general scintillation applications like PET. In recent physics experiment applications, it seems that the liquid scintillator play the important role to find out new phenomena. We think that the MPPC contribute to fulfill the requirements with its high S/N characteristics. But there were several concerns to recommend the MPPC in this application region. One is the wavelength miss-match between the MPPC sensitive region and the liquid scintillator emission (ex. 128nm(liq.-Ar), 175nm(liq.-Xe)). And another is low temperature environment. The temperature stress will cause several kind of damage to the device package. And characteristics of the MPPC will change largely. Especially, the rapid increase of the quenching resistor at low temperature region makes the pulse shape to be lower and longer than room temperature.

We have tried to adjust the peak sensitivity wavelength by the AR (Anti-Reflective) coating and depth of the active region. We'll show the temperature dependence of the quenching resistor will greatly suppressed by introducing new technology. We are also trying best matching materials (substrate, resin and adhesive) to achieve the high reliability package at low temperature condition.

quote your primary experiment

MPPC

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