

Single Photon Calibration for Multi-Channel SiPMs

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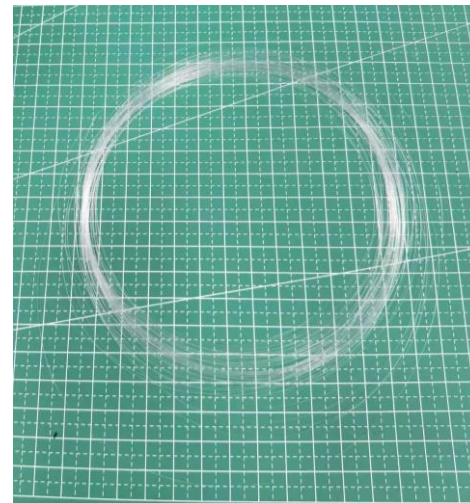
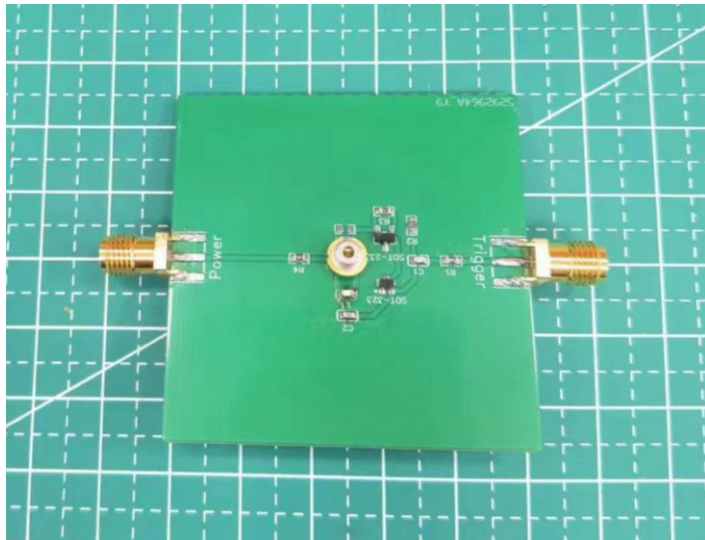


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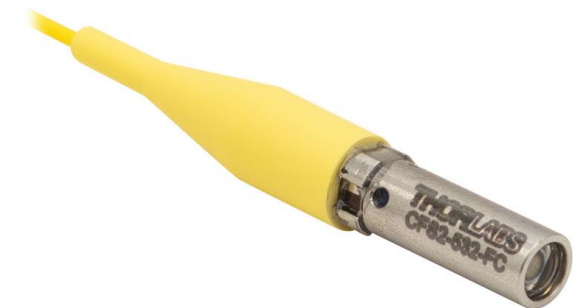
Motivation & Method



- Single PE calibration for multi-channel SiPMs in ECAL module
- Laser diode as a light source. The light is divided into multiple channels by optical fibers.
- SiPMs tested: NDL EQR06, EQR15-11-3030D-S



Plastic fiber, Φ 0.5mm

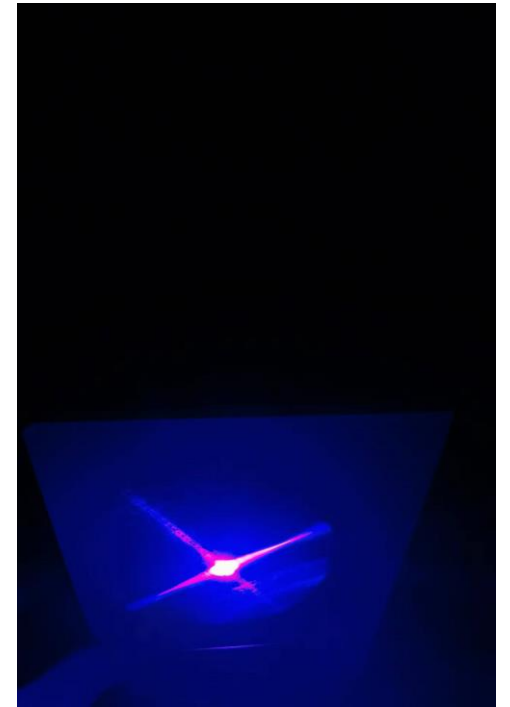
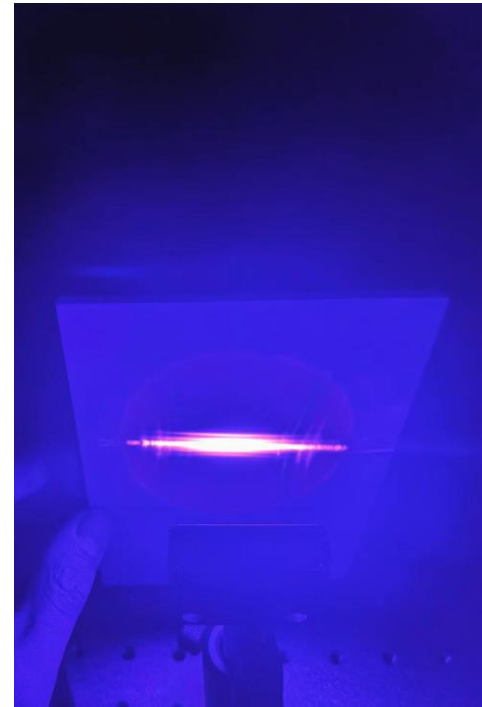


Collimator

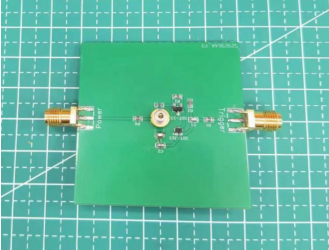
Light Spot of Laser Diode



- When the receiver is close enough($<1\text{cm}$) the to laser diode, the spot can be controlled within 1cm .



Setup

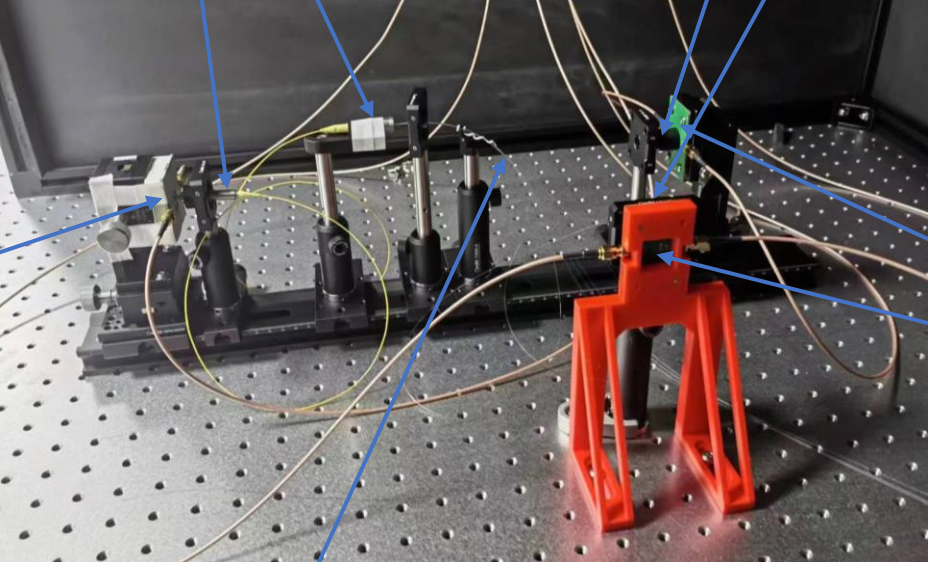


Laser Diode



**Collimator
532/550 nm**

Shield Tube

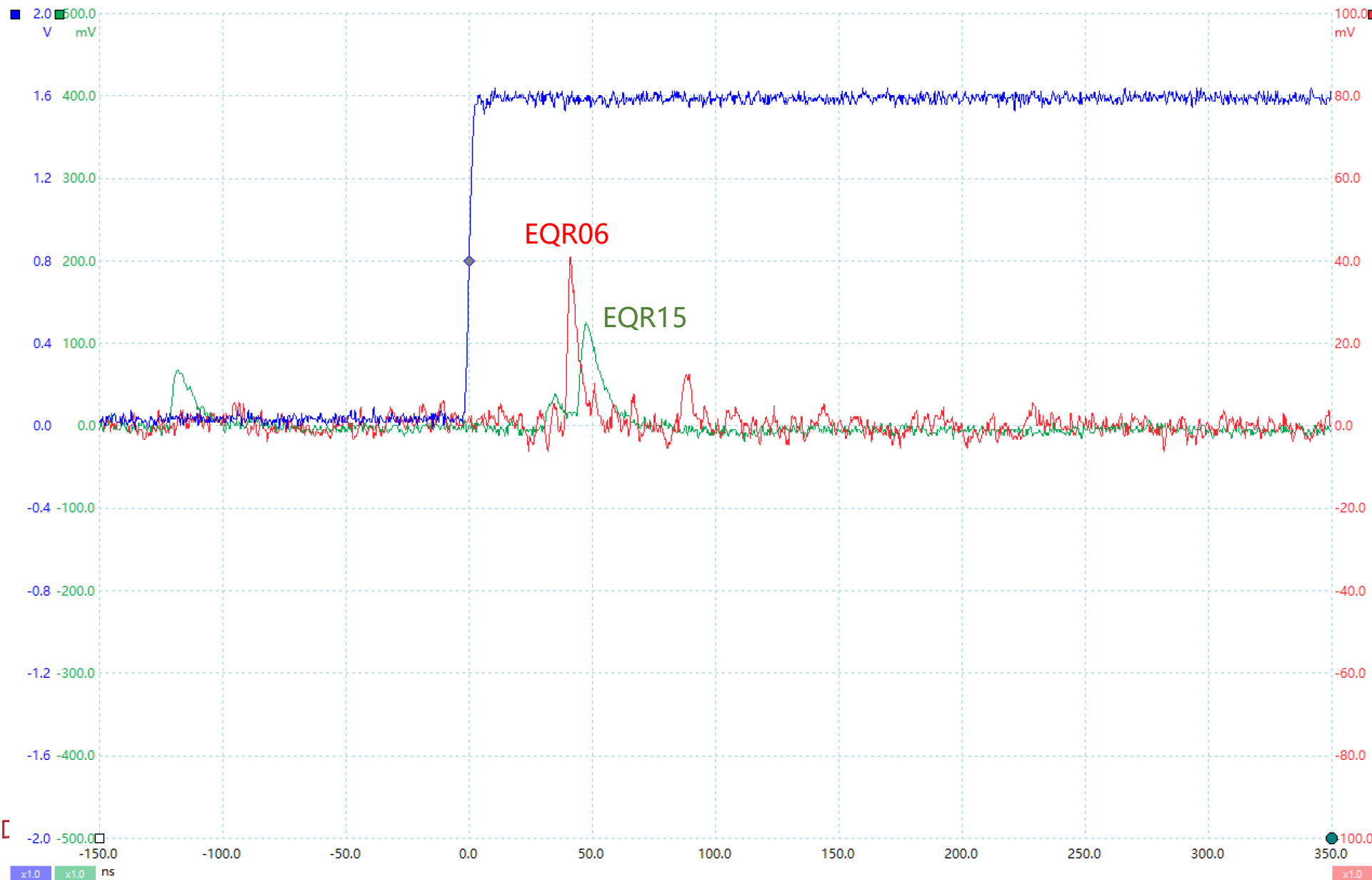


SiPMs

**Fiber x5
650 nm**



Waveform

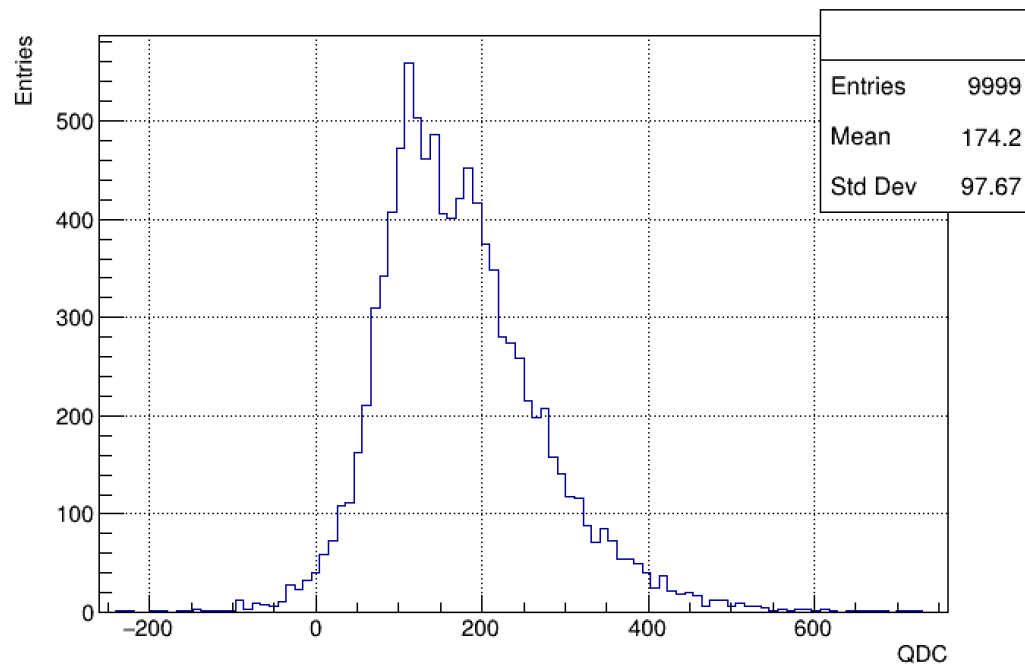


Calibration Result of 2 Channels

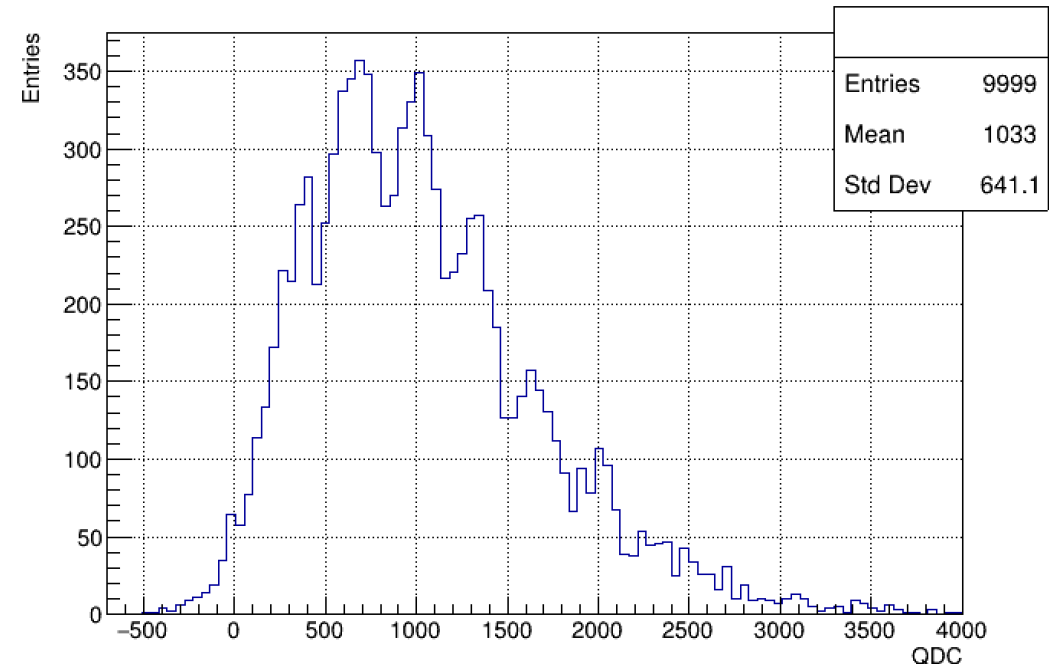


- The light uniformity of different channels looks not bad. But resolution of result-EQR06 is bad, we can hardly discriminate different peaks.

EQR06



EQR15





- Use only one type of SiPM
- Do the experiment without collimator to see whether the uniformity and light intensity can be improved
- Check the performance of more channels
- Scintillator + SiPM