Couple comments about pulses and upcoming beam test

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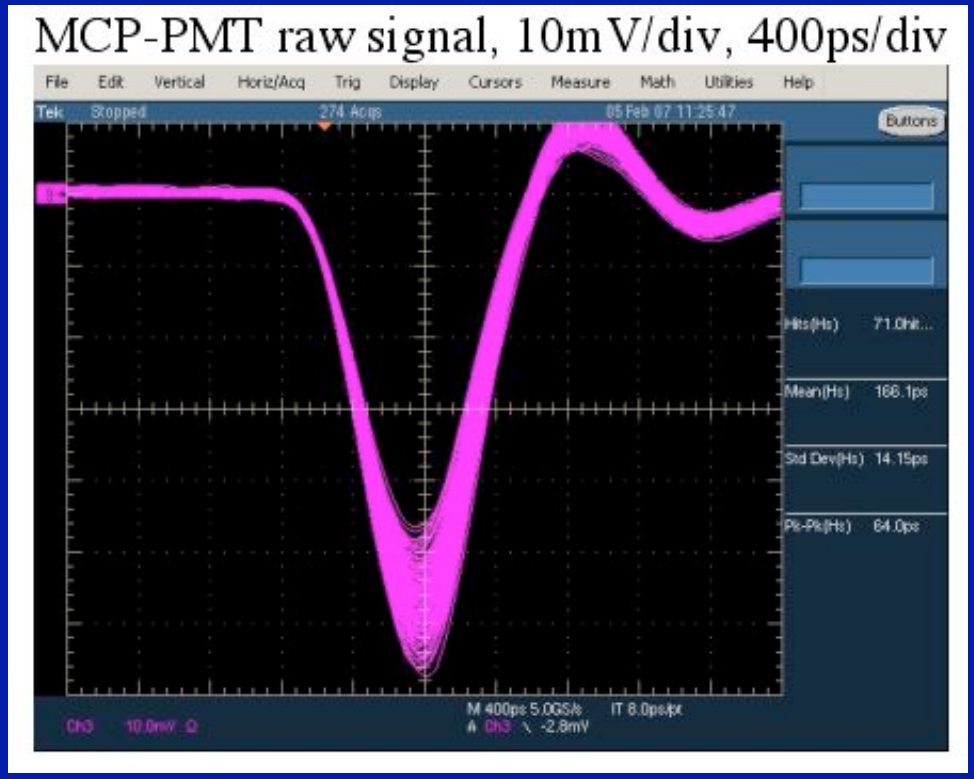
Content

- **Scope pulses**
- **Jeff Peck QTNT circuit to measure the pulse height charge**
- **Our thinking for the next MCP-PMT order**

~50 photoelectrons with no amplifier

Run 213, TOF #1: 2.33kV, 1st chain, 1 GHz BW scope, single pixel (all other pads shorted to ground)



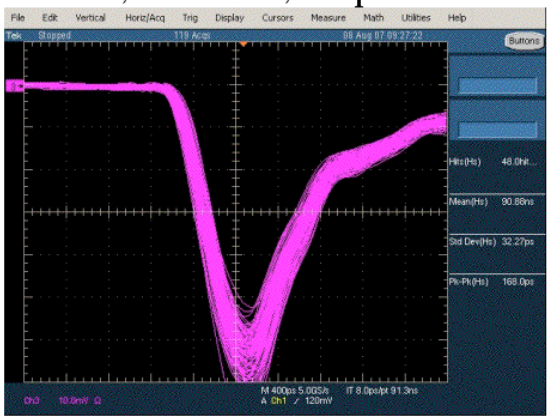
~50 photoelectrons with no amplifier

10μm holes, no amplifier, 1-st chain, 1 GHz BW scope, 4 pads shorted together (all other pads shorted to ground) :

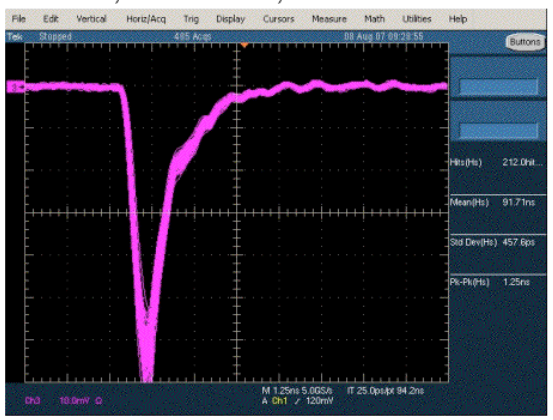
TOF1:

Run 279, raw MCP signals, ~50 pe, TOF#1:

2.29 kV, 10mV/div, 400ps/div



2.29 kV, 10mV/div, 1.25ns/div

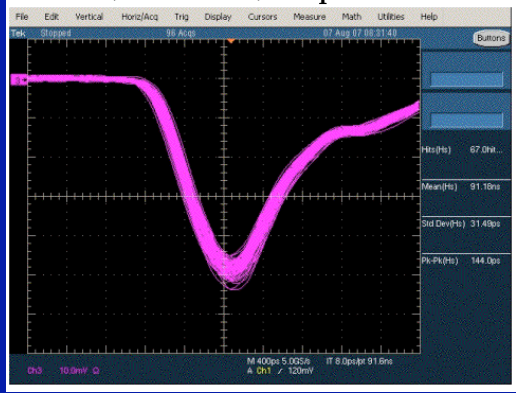


TOF2:

New ground plane

Run 275, raw MCP signals, ~50 pe, TOF#2:

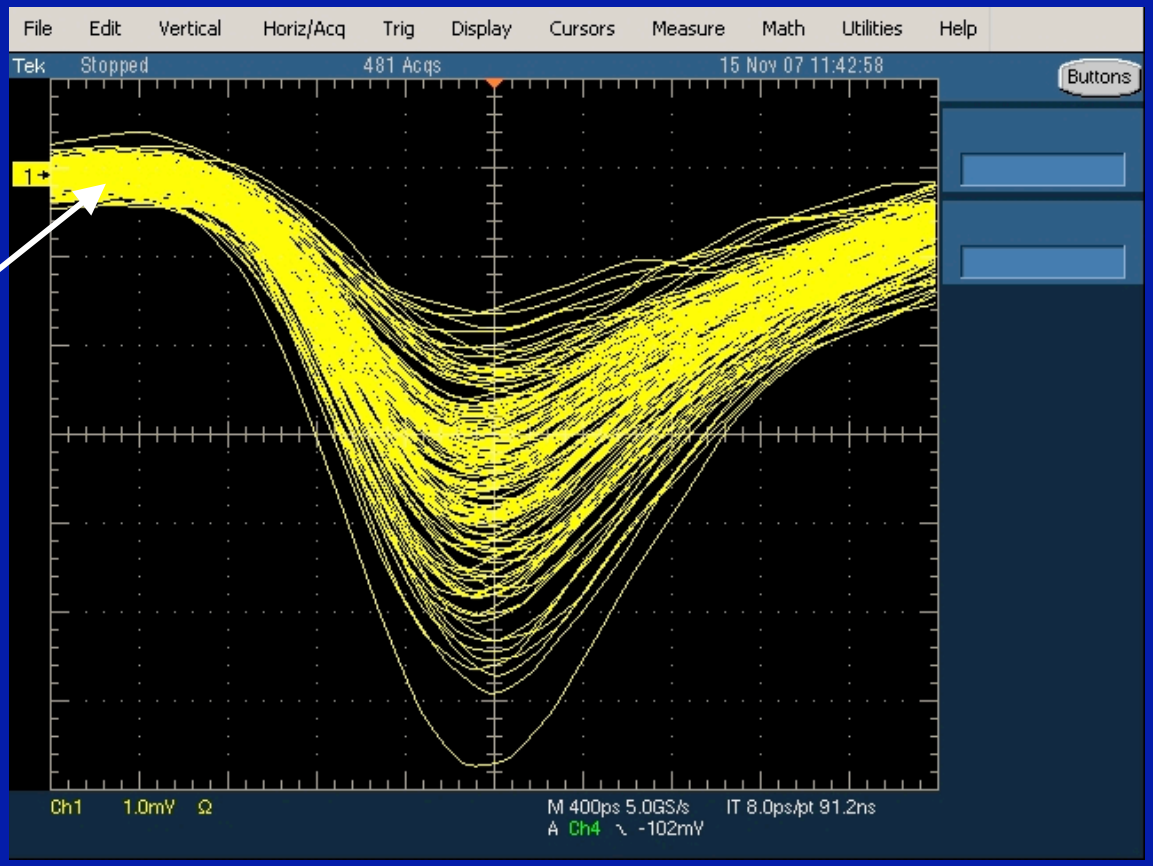
1.91 kV, 10mV/div, 400ps/div



1.85, 1.88, 1.91, 1.93 kV kV, 10mV/div, 400ps/div

~9 photoelectrons with no amplifier

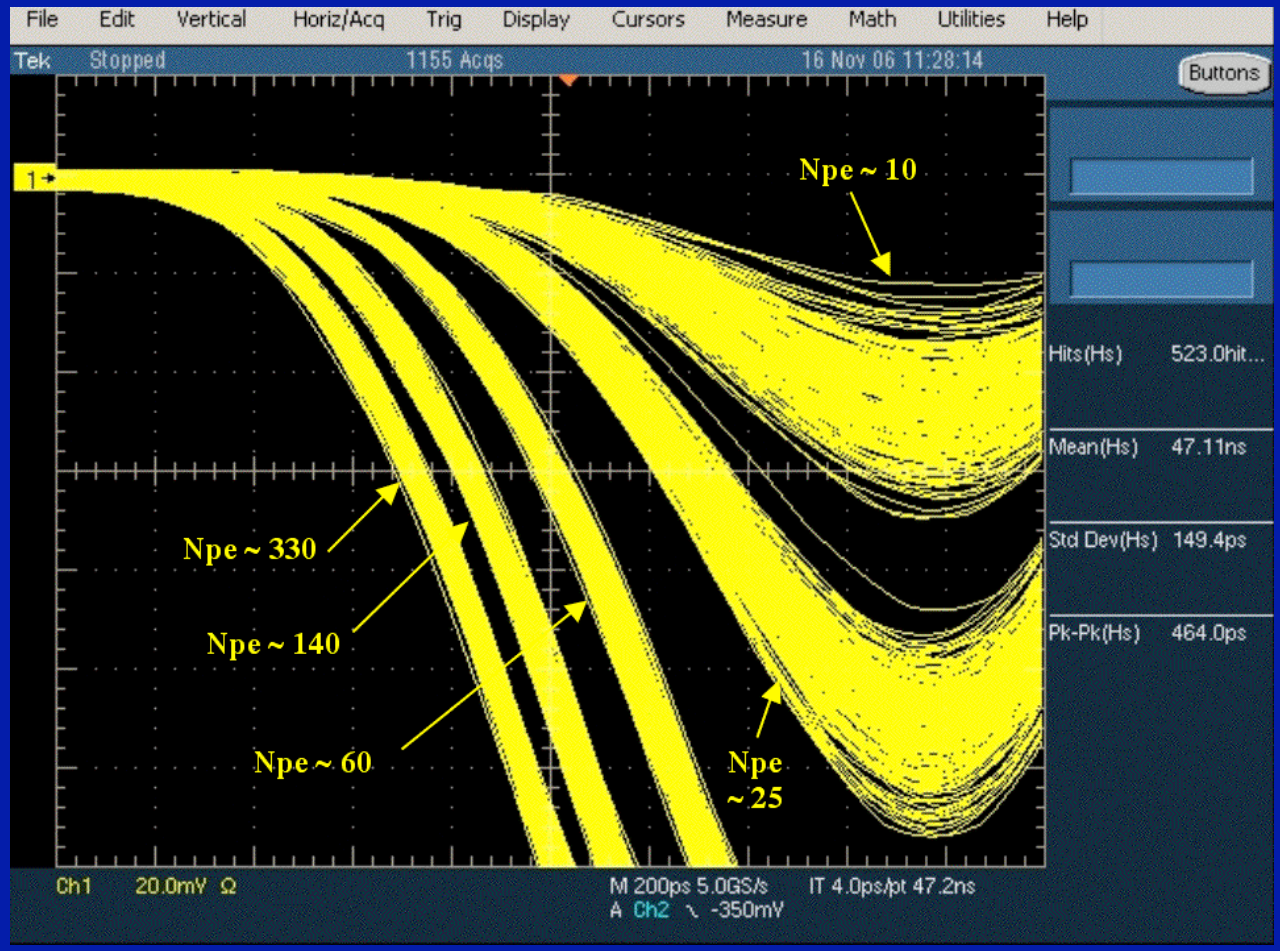
Run 377, TOF #1, 2.88kV, 2nd chain, 4 pads shorted together, 400ps/div, 1mV/div, (all other pads shorted to ground) :



This test has a larger noise from some reason (ESA test beam).

Raw MCP pulses with no amplifier

Run 174, 10 μm, no amplifier, 1st chain, 1GHz BW scope, single pixel, 200ps/div, 20mV/div, (all other pads shorted to ground) :



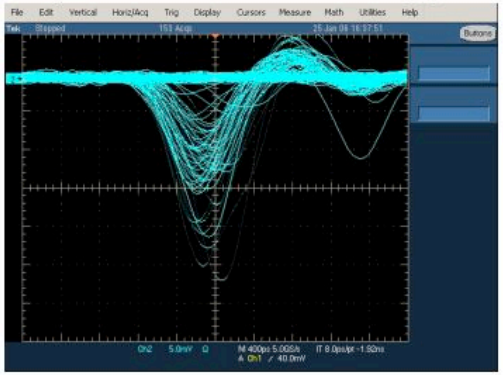
Single photoelectrons with no amplifier

Raw MCP-PMT single photoelectron pulses

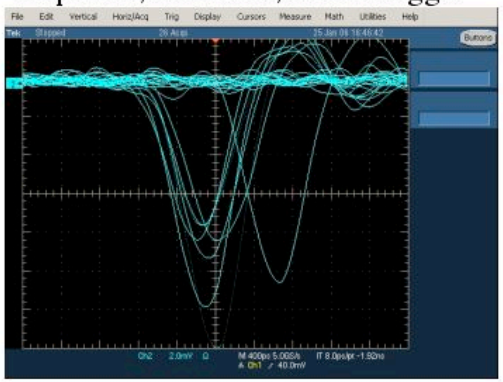
1.25.2006

- **2.80kV, 10μm hole 64 pad MCP-PMT** (S/N 11180401), B = 0kG
- **No amplifier – directly from MCP-PMT via ~9 ns-long cable to a scope Tektronix TDS 5104**

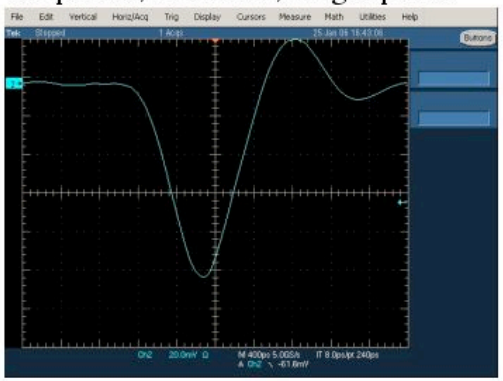
400ps/div, 5mV/div, PiLas trigger



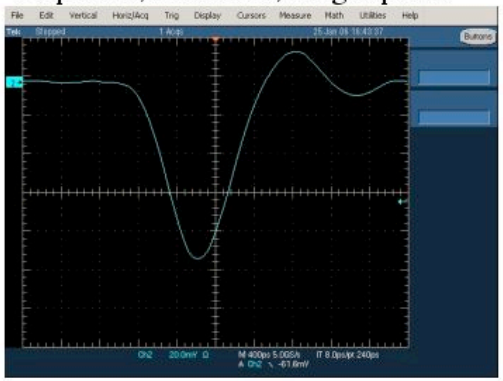
400ps/div, 2mV/div, PiLas trigger



400ps/div, 2mV/div, single pulse

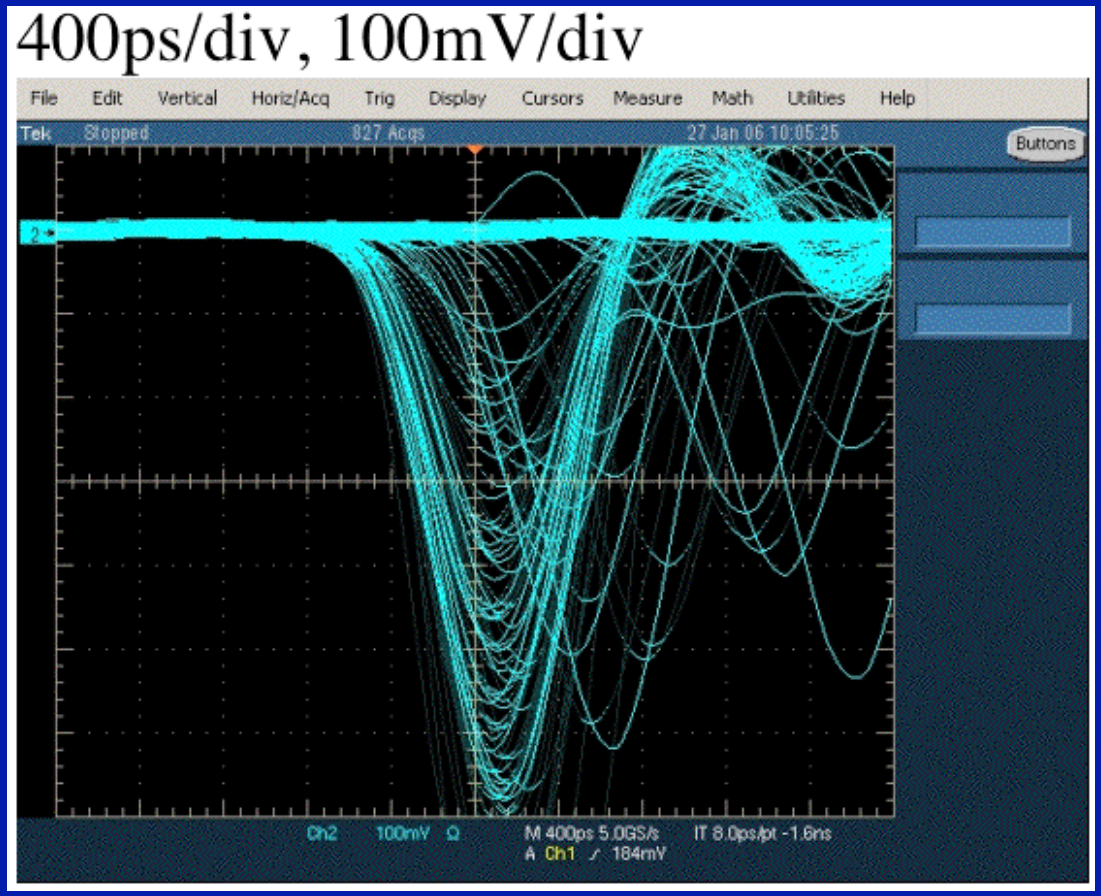


400ps/div, 2mV/div, single pulse



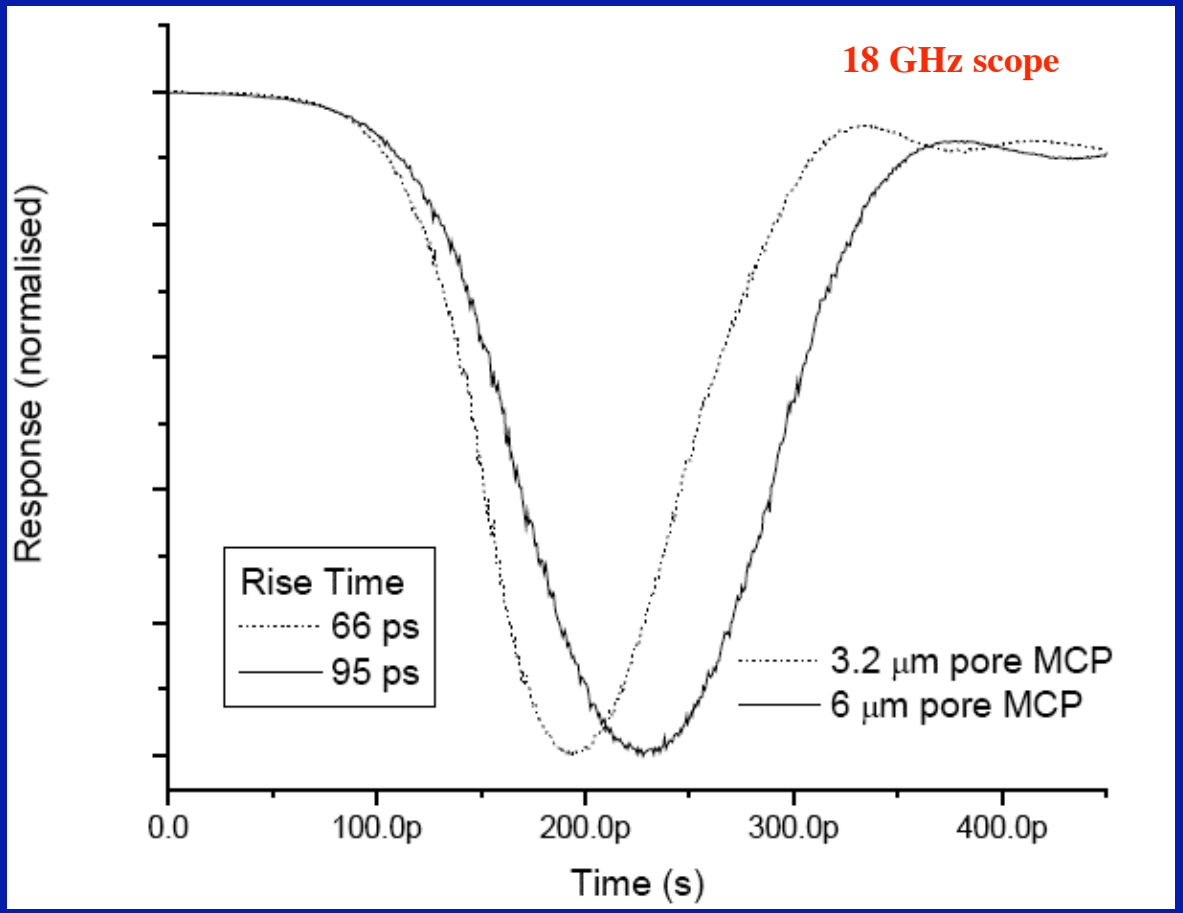
Single photoelectrons with an amplifier

10μm MCP holes, 2.8kV, 1st chain, 1.5GHz BW amp., 1GHz BW scope, single pixel (all other pads shorted to ground) :



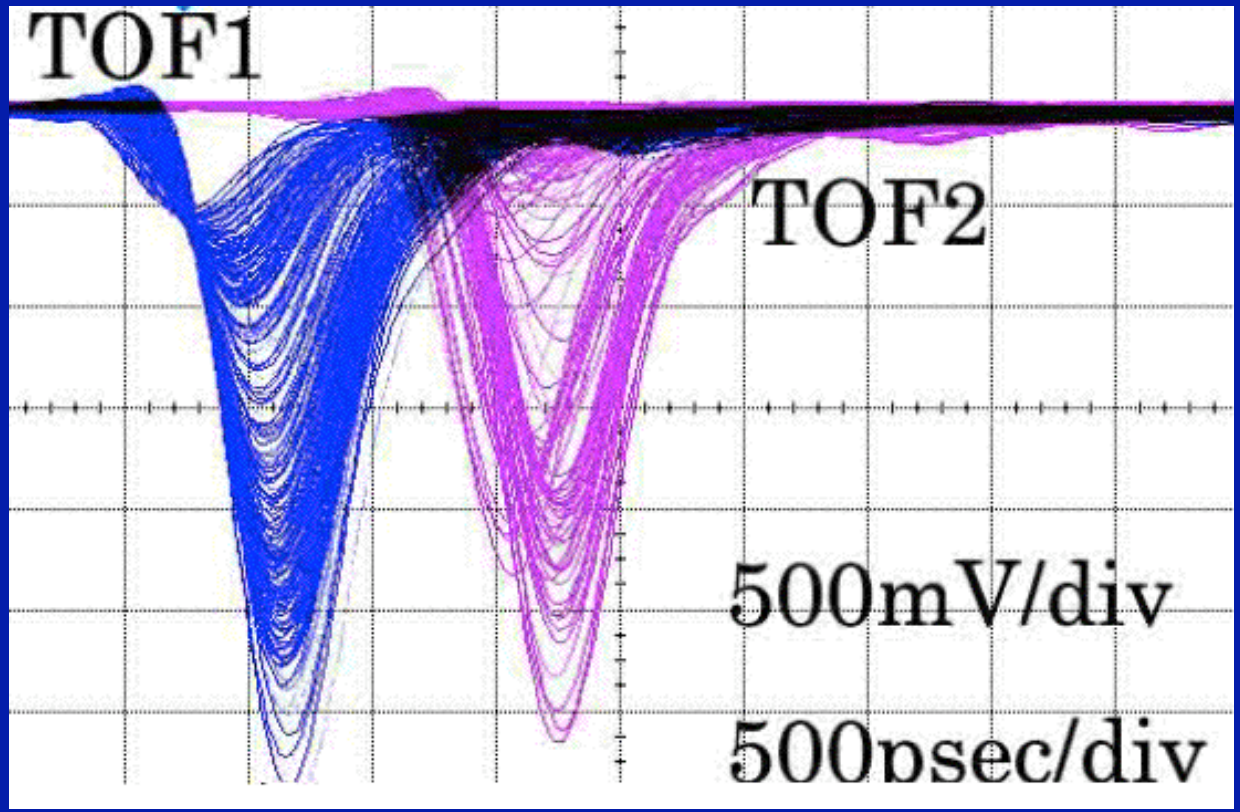
Raw pulses

Photek measurements:

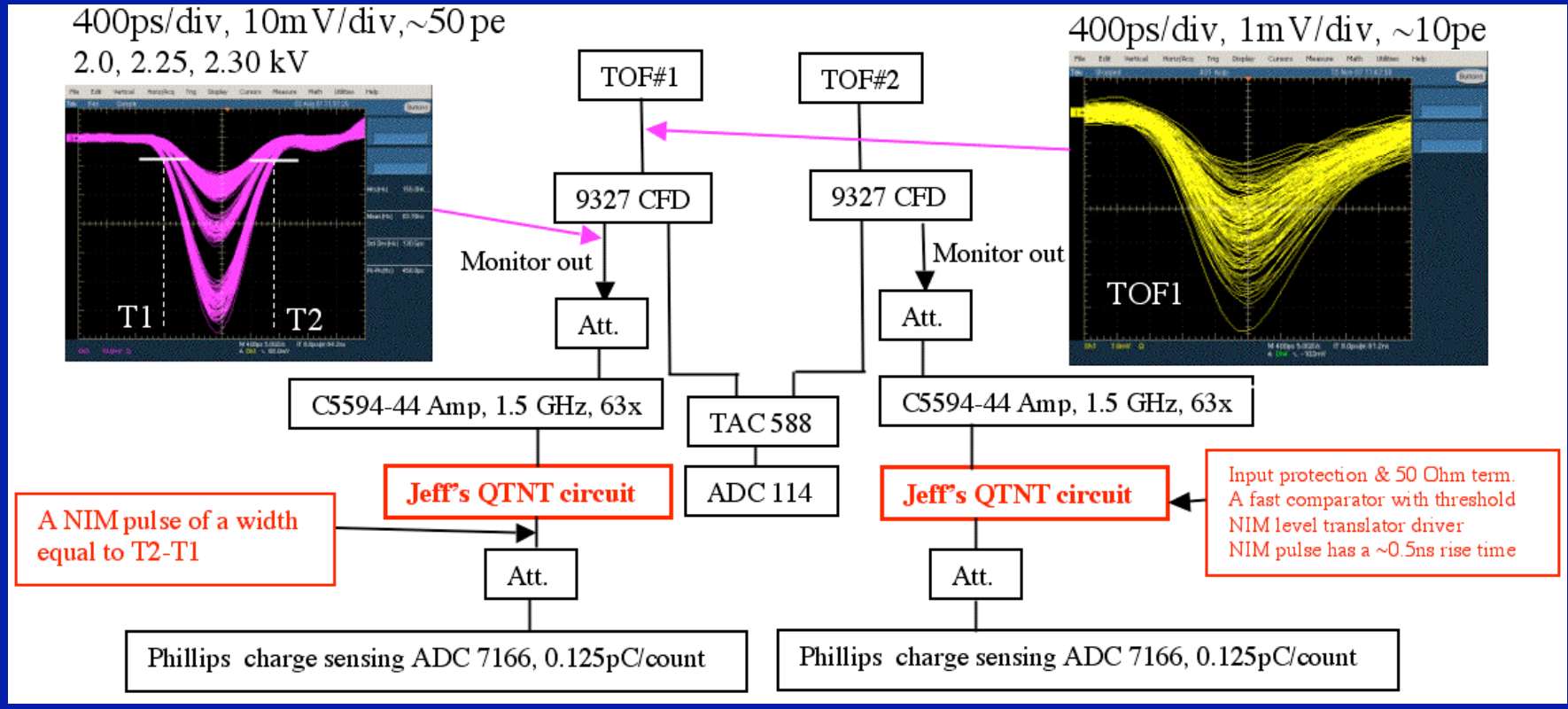


~50 photoelectrons with amplifier

Nagoya (6μm holes, 1.5GHz BW amp., 1-2GHz BW scope):

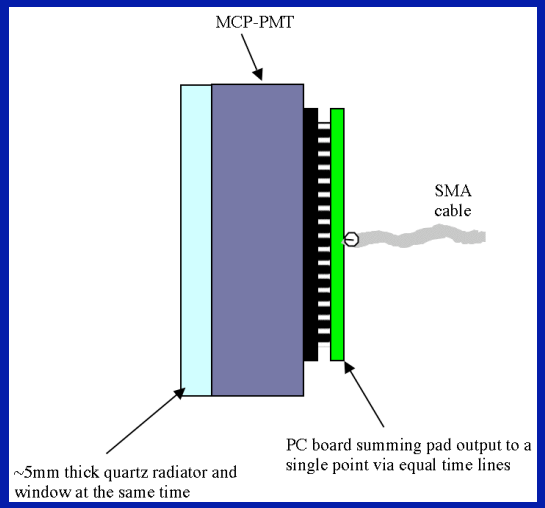


Jeff Peck's QTNT circuit

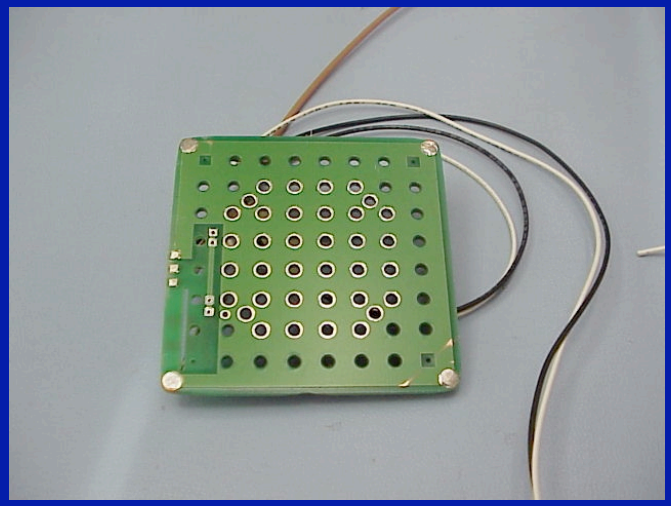


- It is hard to get a good measurement of the pulse height with an ordinary electronics. After many itterations with Jeff, we have come up with a QTNT circuit, which will be plugged into the standard electronics.
- QTNT circuit will be used for a large Npe fluctations CFD cannot handle.

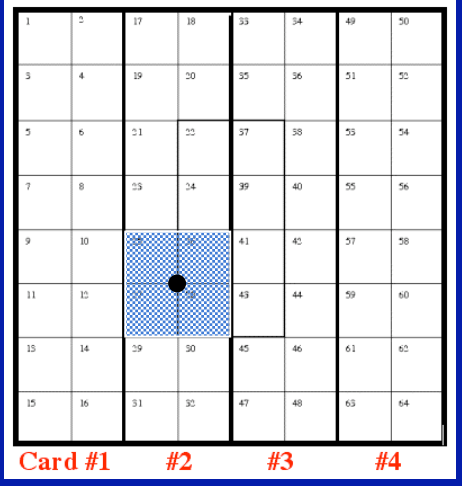
Next two tubes



Ground plane as 85013 series



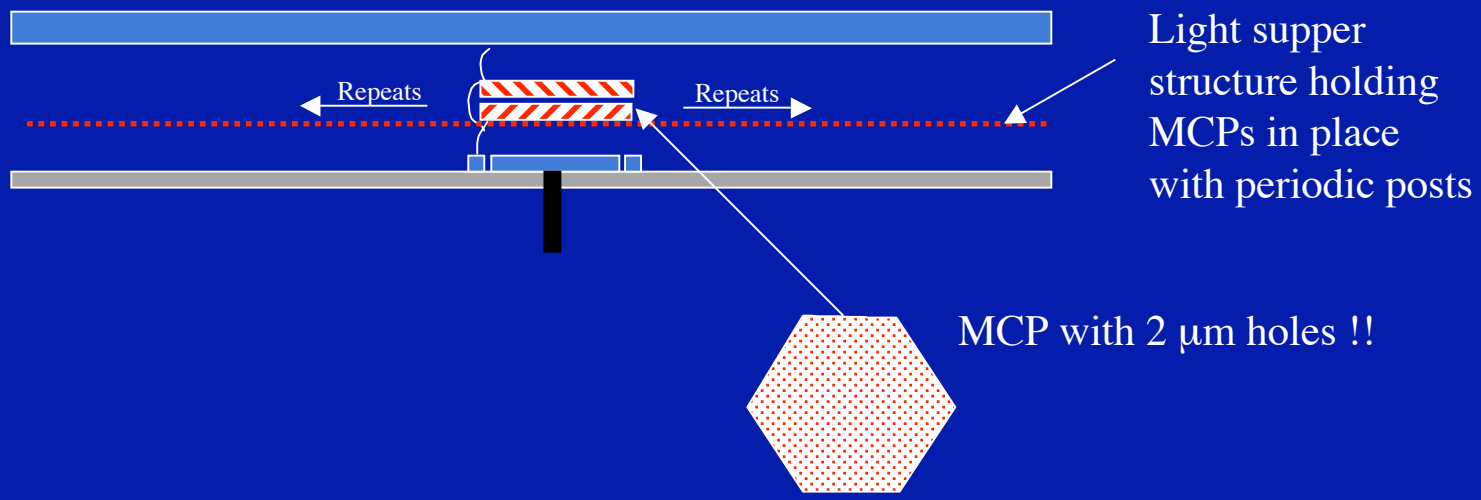
Short 4 pads together



- **Starting parameters, which Burle/Photonis is willing to try next:**
  - 7 mm quartz **drop face plate window** - will be the radiator as well
  - **0.10" anode-to-MCP distance** (this still allows a placement of a getter); oldest tube was 0.2", newer improved "open are ratio" tube is 0.14"
  - **0.03" (864 micrrons) cathode-to-MCP distance**; currently it is ? (5-6 mm)
  - **64 pads, 6x6 mm**, combine 4 into one just like we did so far. This would create 16 macro-pixels.

A modular structure for future photon detectors ?

- Manufacturer would come up with a modular detector vacuum containers
- Depending on "wishes" of a customer, they would drop in into a standard support structure inserts with MCPs, which would form a coaxial structure
- A schematic description:



- A size of the vacuum vessel is variable
- It seems to me that somebody should think about this…