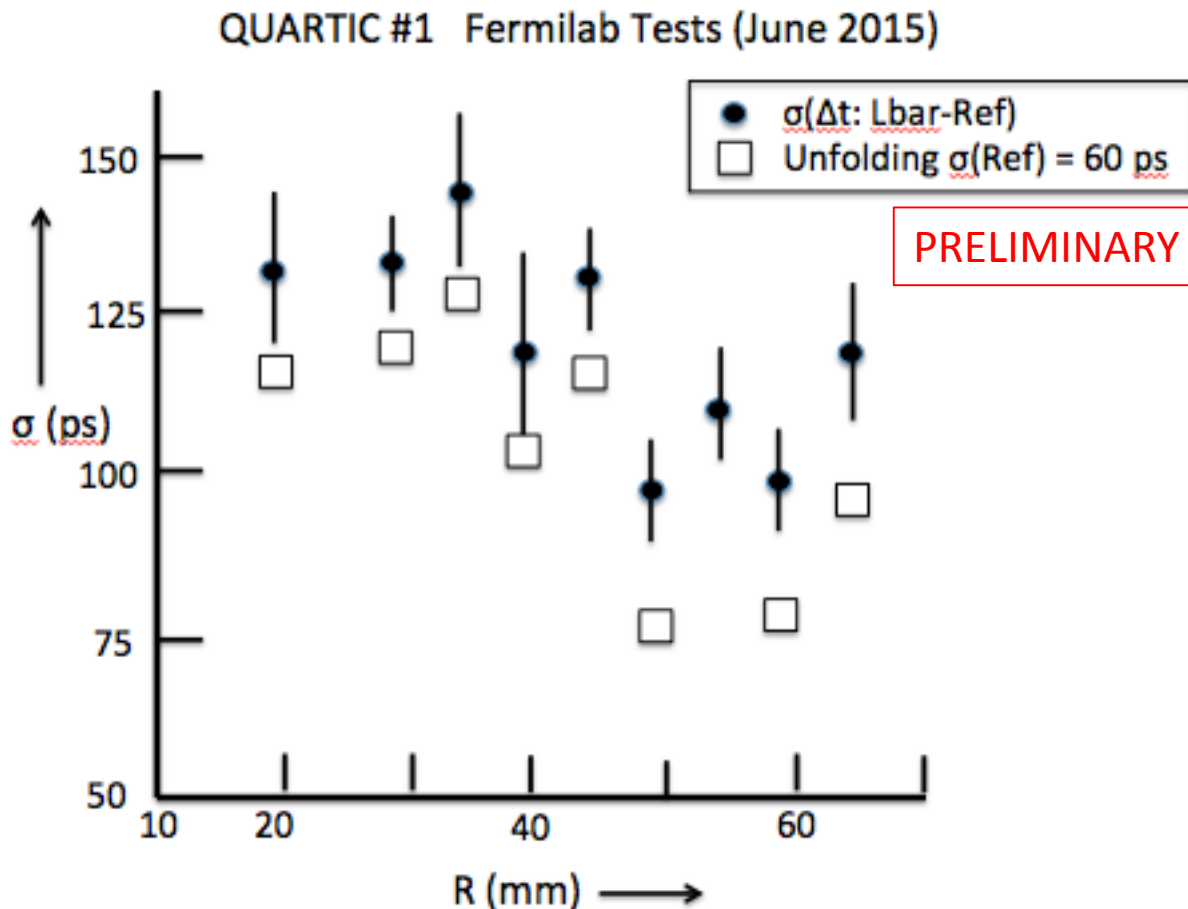


Fermilab beam tests of prototype

QUARTIC Test boxes (2 bars x 4 boxes) in 2012 showed $\sigma(t) \sim 30 - 35$ ps (Fermi beam test)
20-channel prototype shows (preliminary) much worse resolution:

Christina Snyder



Notes:

σ (ps) is from fit to Gaussian of time difference (highest PH bar – Planacon)

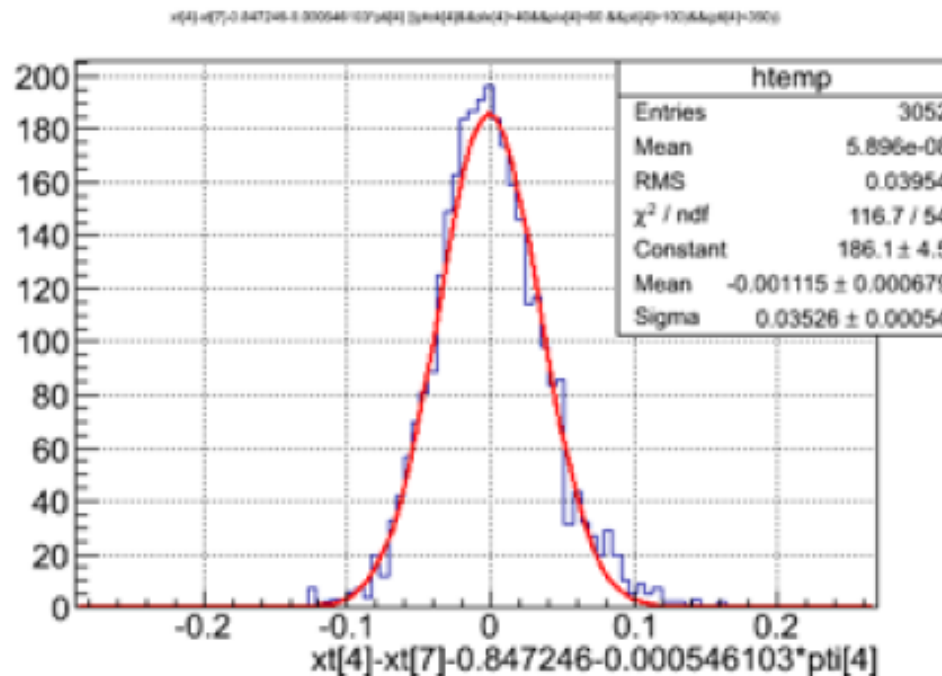
Error bars show rms spread of 3 runs to different DRS channels (syst.)

Unfolding is estimated σ (ps) if Planacon ref has $\sigma(t) = 60$ ps.

Tests 2012:

30mm L-bar – Photek240 ($\sigma \sim 8\text{ps}$)

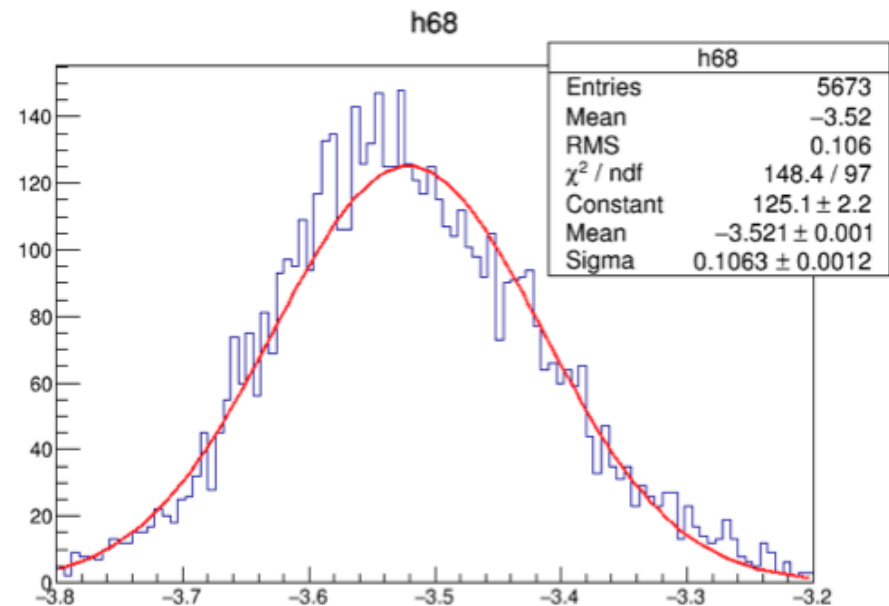
$\sigma(\text{gauss}) = 35.3\text{ ps}$



Prototype 2015

65mm L-bar – Planacon ($\sigma \sim 50\text{-}60\text{ ps}$)

$\sigma(\text{gauss}) = 106\text{ ps} \rightarrow 90\text{ps unfolded}$



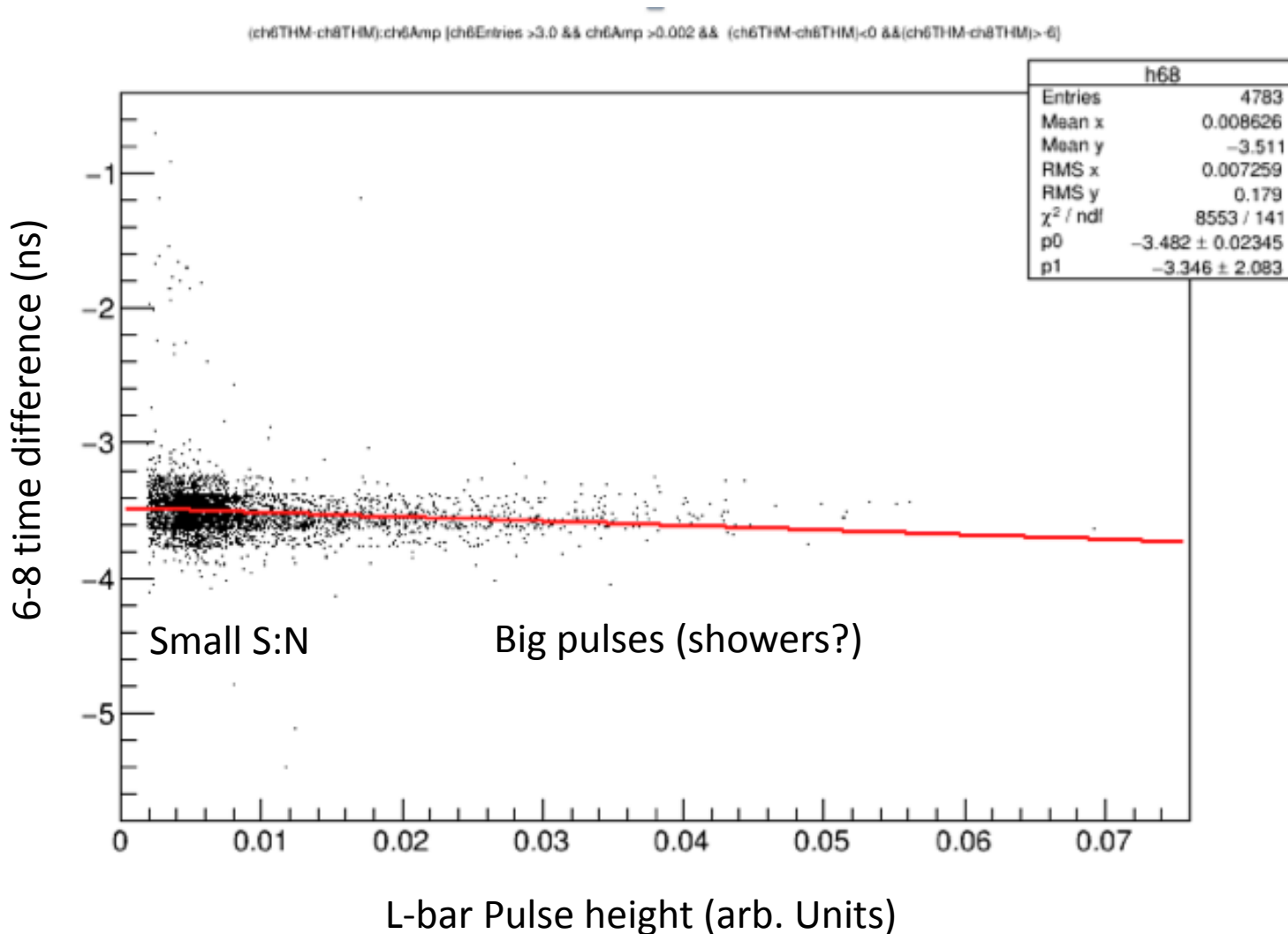
Hypothesis: Light loss (sharing, reflections, pads, transmission, ...)

Tracking, selecting clean single track through bar. On to-do list for Fermi tests. & CERN?

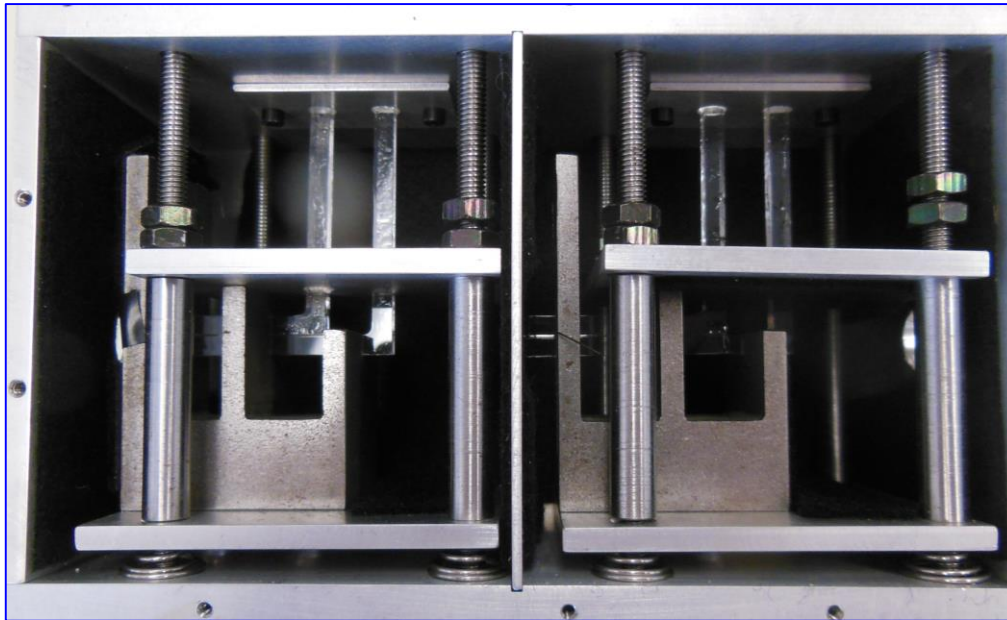
When/if light shared, can all hit bars be used for single protons in?

What is distribution of total light signal? # P.E.s ?

Pulse-height slewing correction?
Not very important (at least for L-bar)
Example (bar 6: 65mm):



Differences between 2012 test module and 2015 prototype



Bars are 3mm x 3mm in both

2 bars per module adjacent on one side

Separated by 2 x 200 μ m wires

R bars 30mm and 40mm

LG bars 40mm and **43.2 mm**

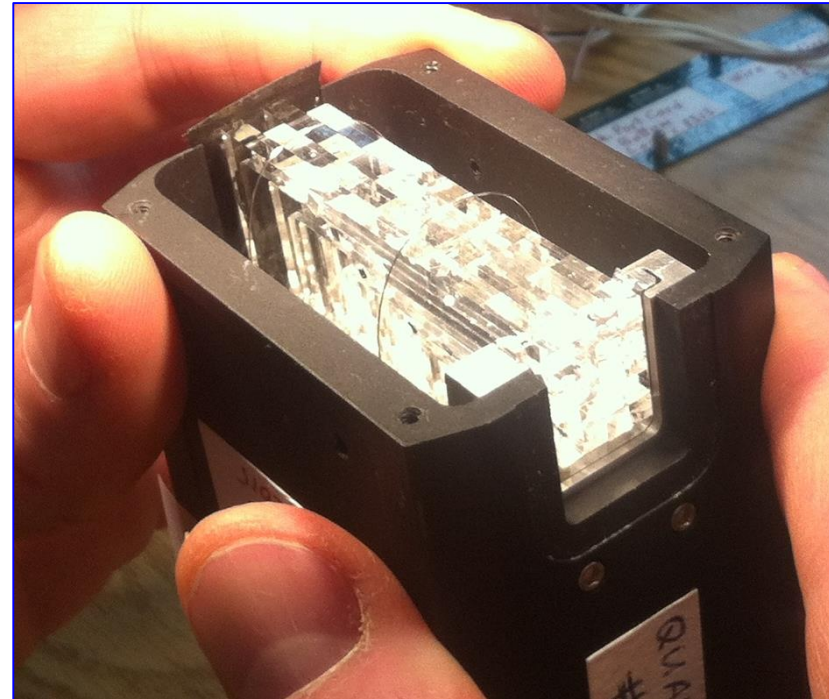
Bars from Specialty Glass (US)

SiPMs = S10931 / 10362 Hama – MPPC

Beam : 2mm x 2mm trigger counter in centre bar

10pF shaping \rightarrow ORTEC VT120x20 preamp.

$\sigma(t) = 30 - 35$ ps



20 (4x5) bars adjacent on 2,3, or 4 sides

Separated by 2/adj.side Al foils + glue spot

R bars 18 – 63mm

LG bars **58.8 – 71.2 mm**

Bars from IHEP (V. Samoylenko)

SiPMs = S-12572-050-P

Beam : **Covers area; select “hot” bar.**

Diff. ampli, less bandwidth?

$\sigma(t) = 75 - 125$ ps