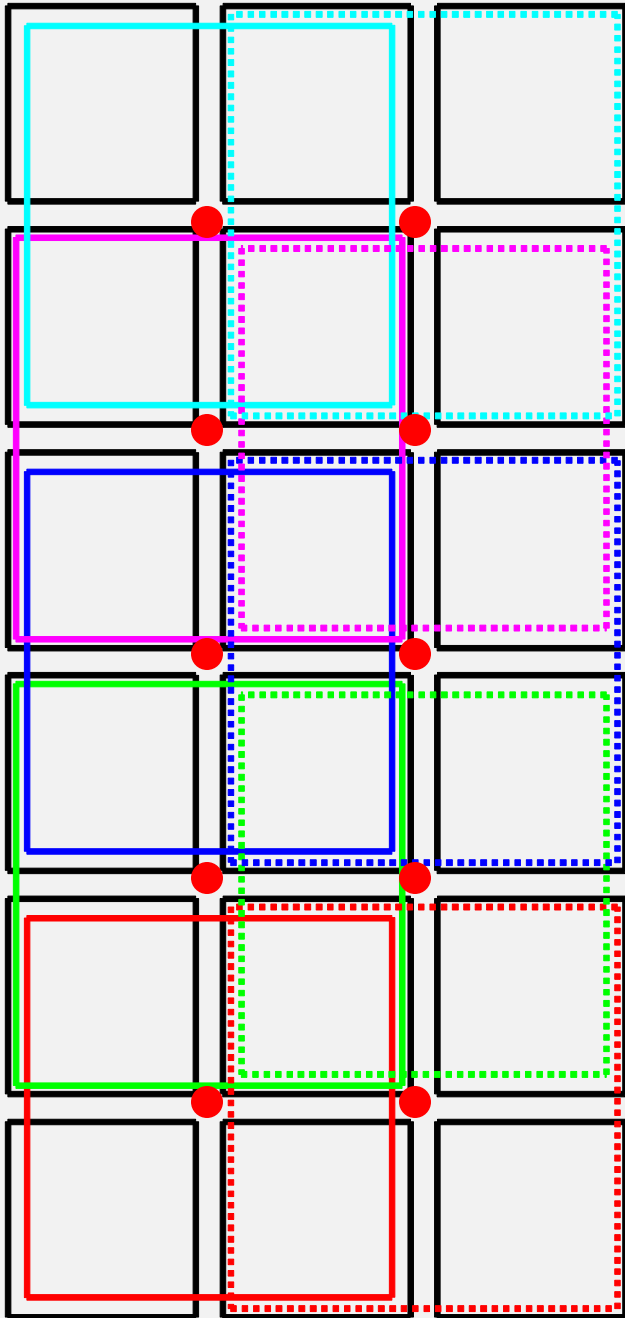


HCal Electronics

with First-level ECal trig

B. Quinn

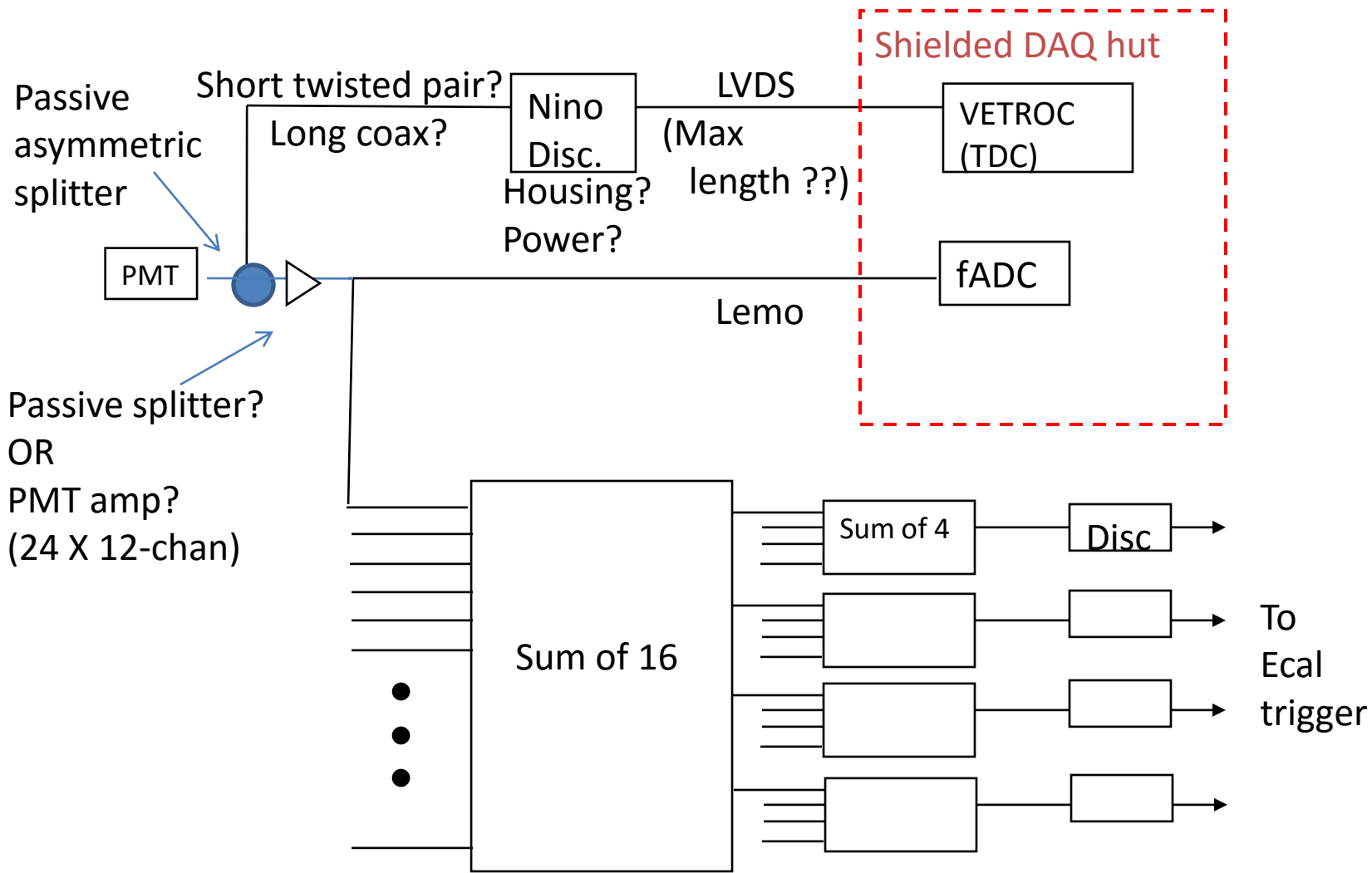
Mar. 9, 2016



Form overlapping **regions** by taking all possible 2X2 sets of (4X4 module) **groups**. Each group is a member of four regions (or less).

Total of 10 regions to be summed to give total energy in region. Each sum can be compared to threshold.

Ten logic signals to send to ECal to look for energy in region of HCal expected to correspond to ECal hit.



(18 groups)

(10 regions)

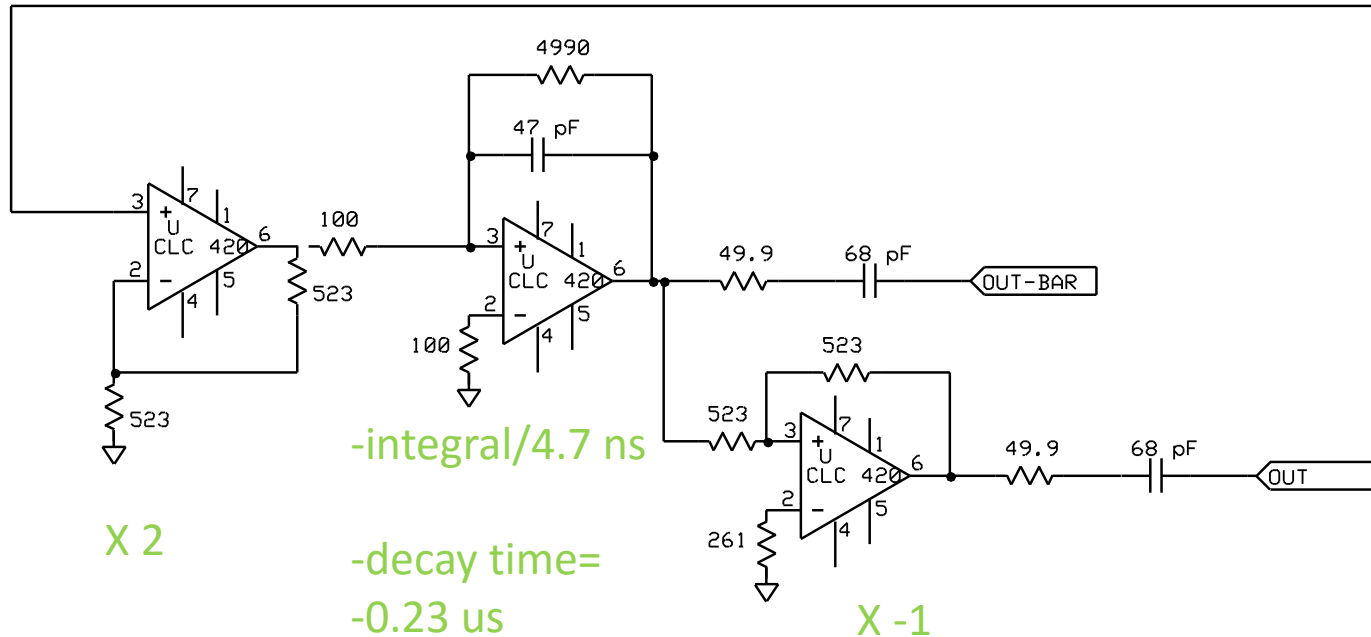
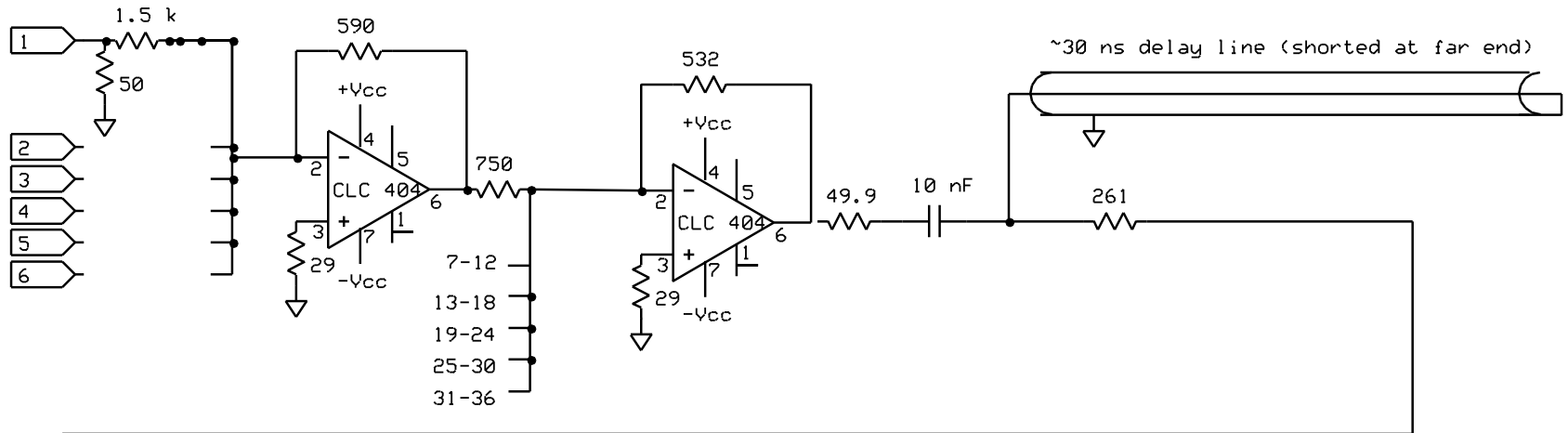
18 Uva Summing mod.
36 in -> 18 in (16 used)

3 quad linear FI/FO (e.g. Pillips 740 2.5V)
3 quad L.E. Disc.

18 (at least?) U.Va. 36-fold summing modules available from CLAS

Sum X -0.393

Sum X -0.697

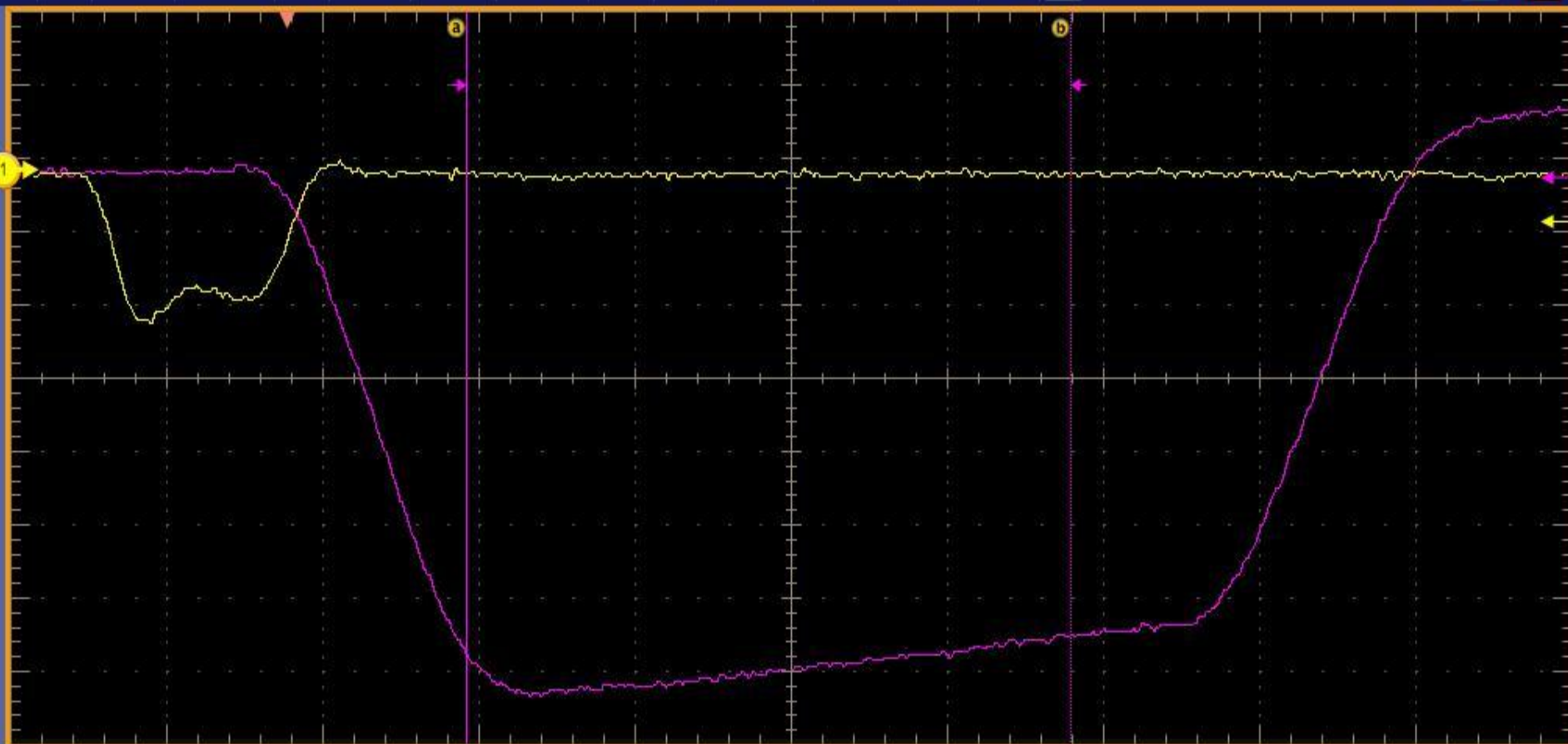


-integral/4.7 ns

-decay time=
-0.23 us

X 2

X -1



C1 500mV/div 50Ω BW:1.0G
C3 50.0mV/div 50Ω BW:1.0G

t1 11.5ns
t2 50.2ns
Δt 38.7ns
1/Δt 25.84MHz

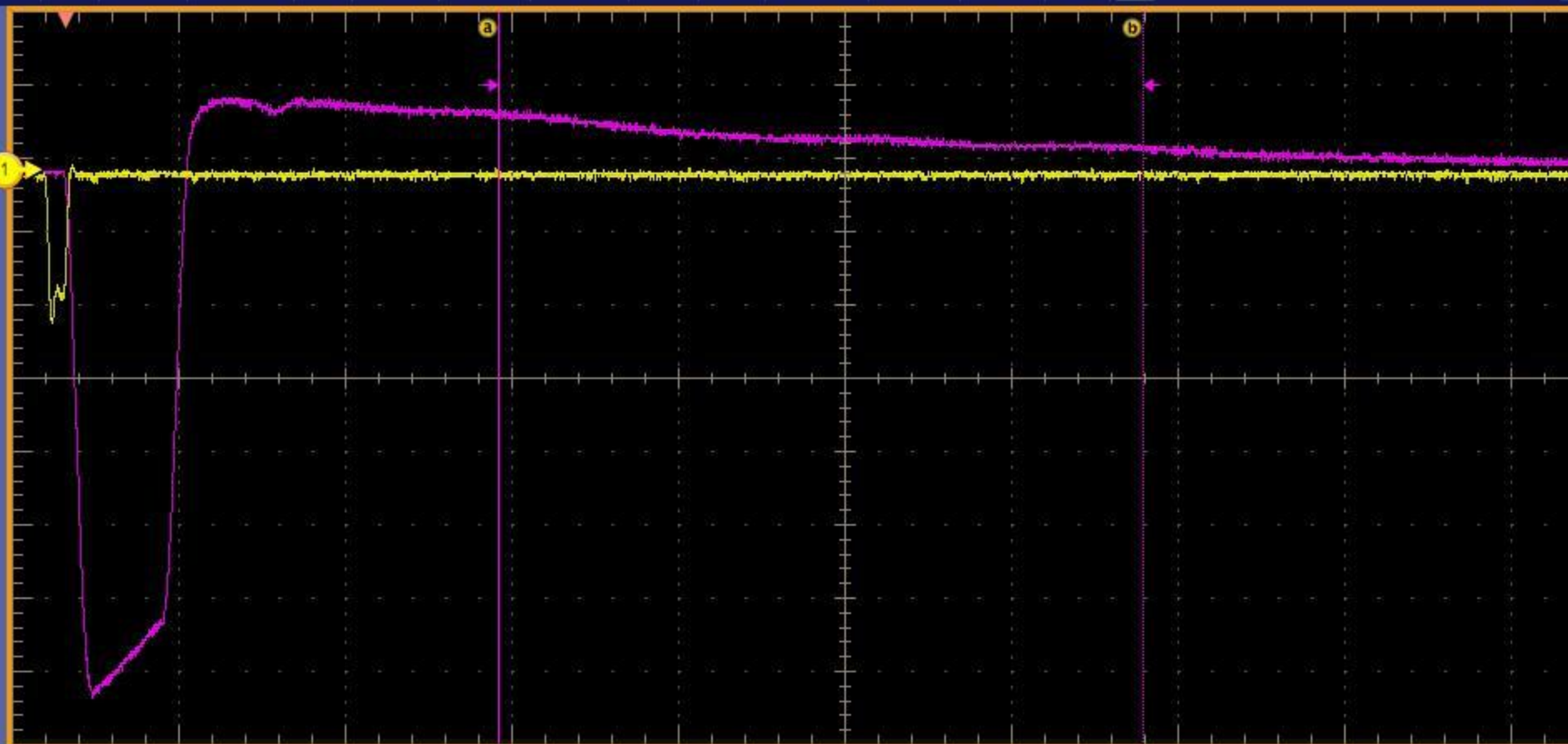
A Pat LXLX AND

10.0ns/div 10.0GS/s IT 50.0ps/pt
 Run Sample
 724 acqs RL:2.0k
 Auto March 08, 2016 20:27:53

	Value	Mean	Min	Max	St Dev	Count	Info
C1 Area*	-1.076nVs	-1.0289254n	-1.203n	-866.5p	55.03p	725.0	
C3 Area	-13.08nVs	-13.114279n	-13.18n	-13.05n	19.38p	725.0	

Cursor Controls

Source	Cursor Type	Move Cursors to Center
Cursor 1	H Bars	Setup
Cursor 2	V Bars	
	Waveform	
	Screen	



C1 500mV/div 50Ω B_W:1.0G
C3 50.0mV/div 50Ω B_W:1.0G

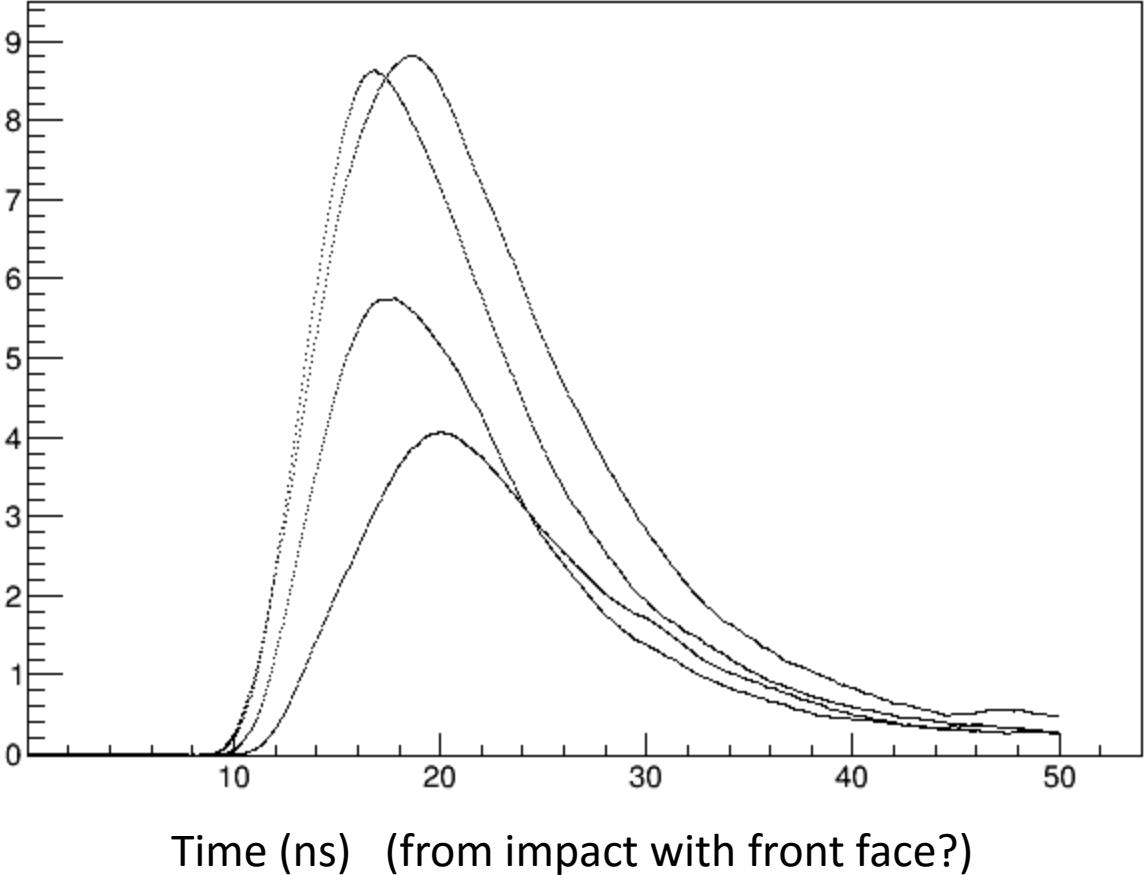
t1 260ns
t2 647ns
Δt 387ns
1/Δt 2.584MHz

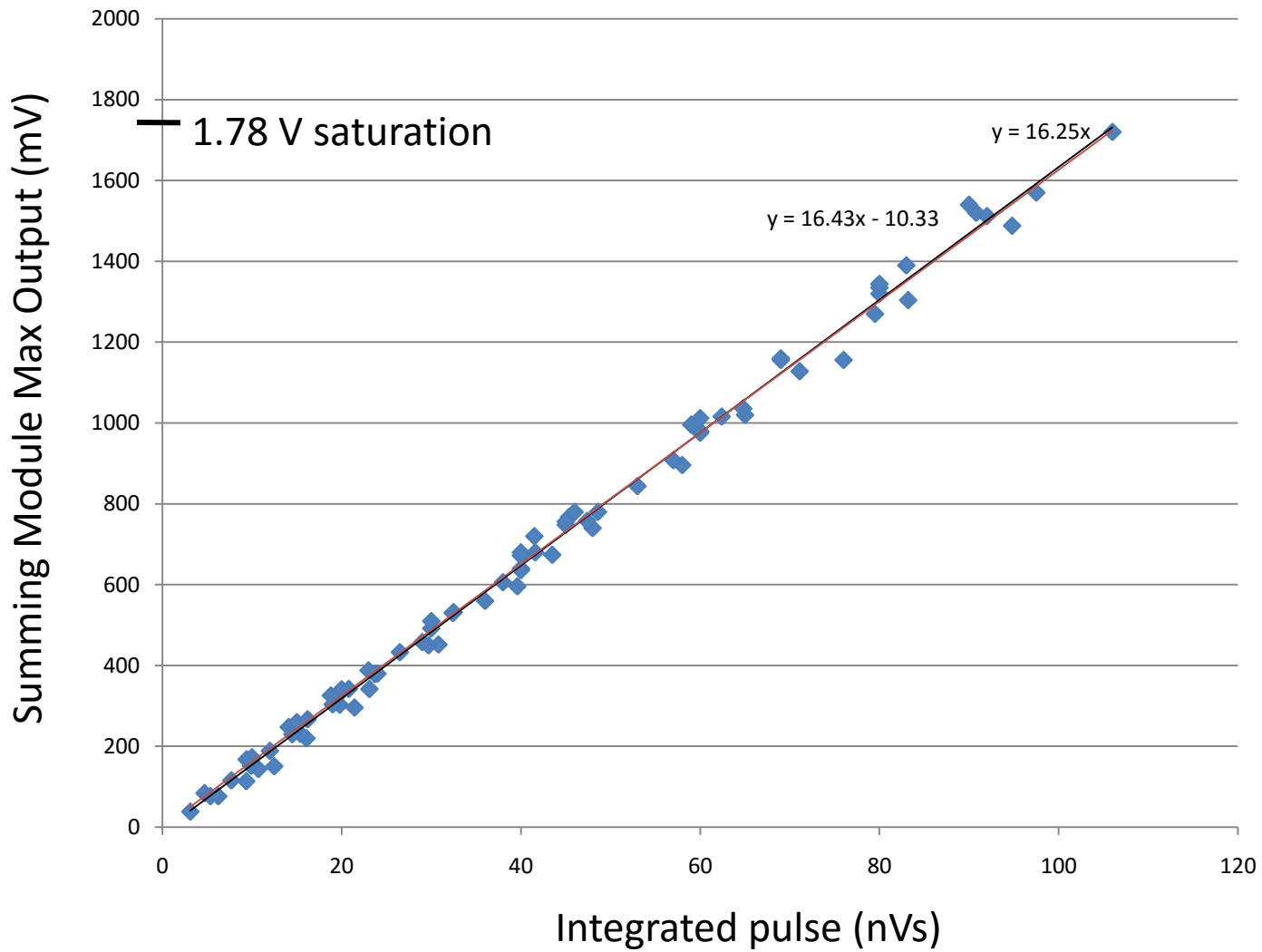
A Pat LXLX AND

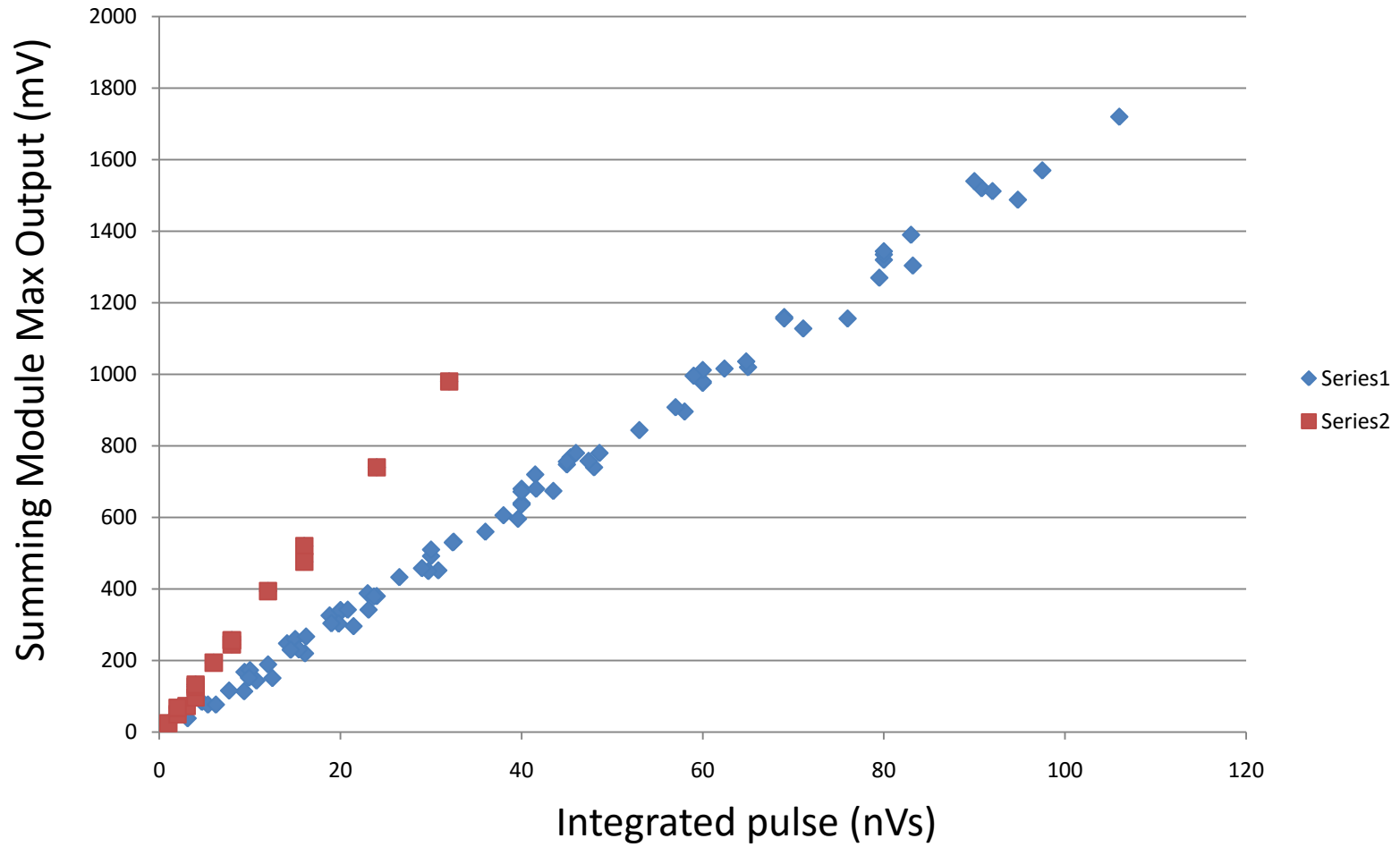
100ns/div 10.0GS/s IT 50.0
Run Sample
 246 acqs RL:20
 Auto March 08, 2016

	Value	Mean	Min	Max	St Dev	Count	Info
C1 Area*	-10.78nVs	-10.830973n	-11.62n	-10.07n	316.7p	245.0	
C3 Area	9.078nVs	9.1152693n	8.822n	9.362n	112.7p	245.0	

HCal signal







To Do / Open Questions

Continue discussion with Chris/Mark to see whether anything clever is possible, or whether modest custom module/board is practical.

Consider construction of patch-panel/asymmetric splitter (3 way?)

Understand 16-input summing circuits (18 needed plus spares)

~20 ns walk acceptable for ECal trigger?

Monte Carlo pileup effects

Decide whether amplifiers are needed (available? 288 chan)

Current due to signal rate + bkg for ~0.2 to 1.0 V signal?

Consider options for housing/power for Ninios

Location? Long LVCS cables acceptable?