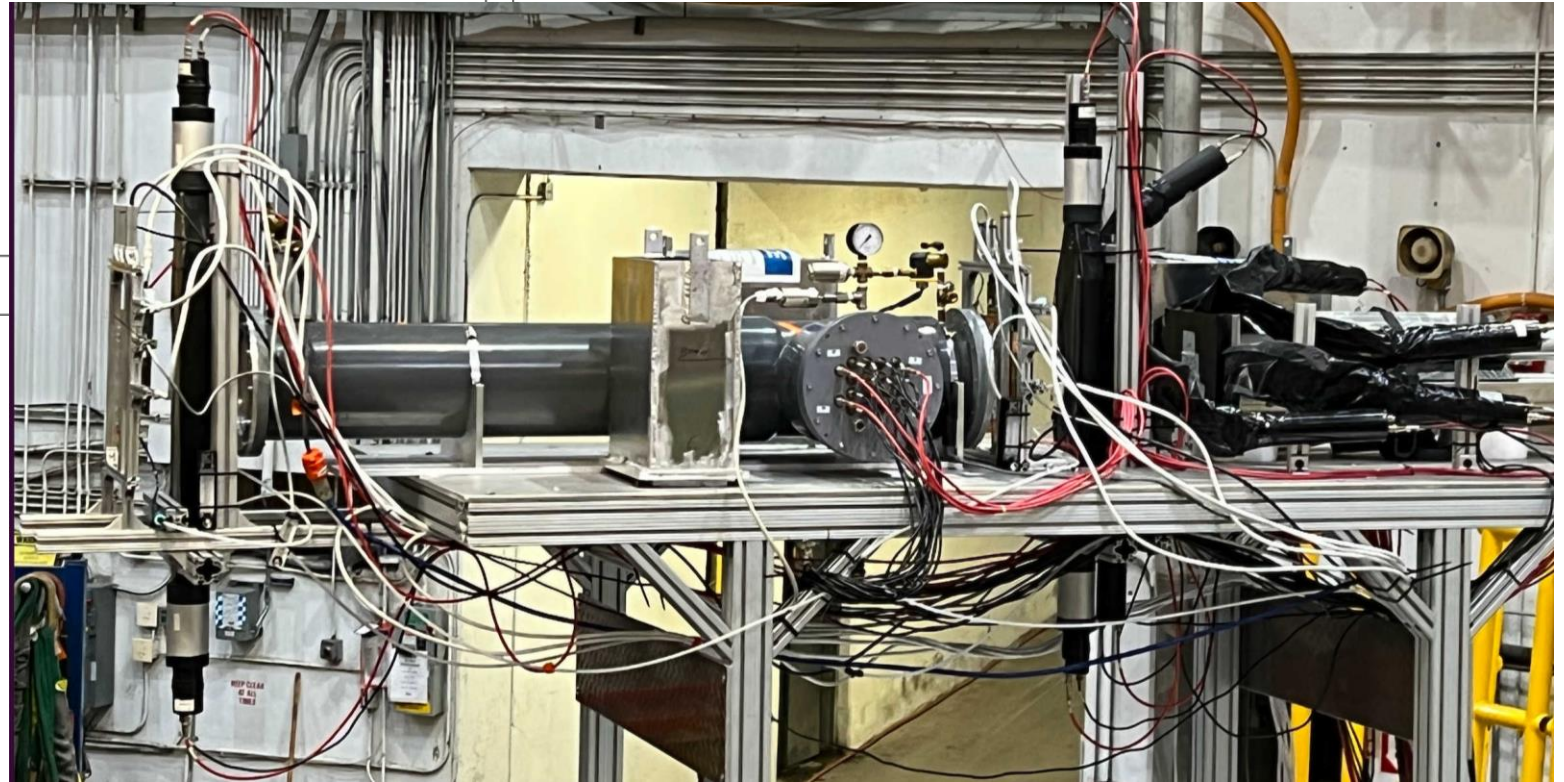
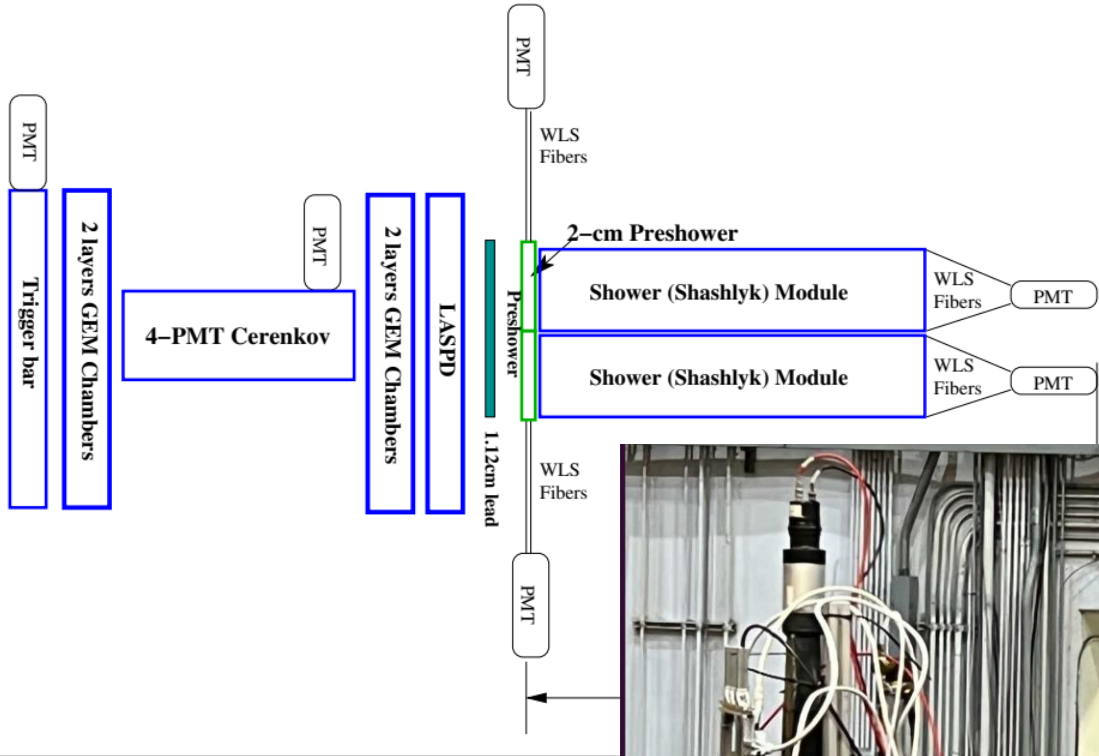


Trigger Design for The High-Rate Beam Test in Hall C

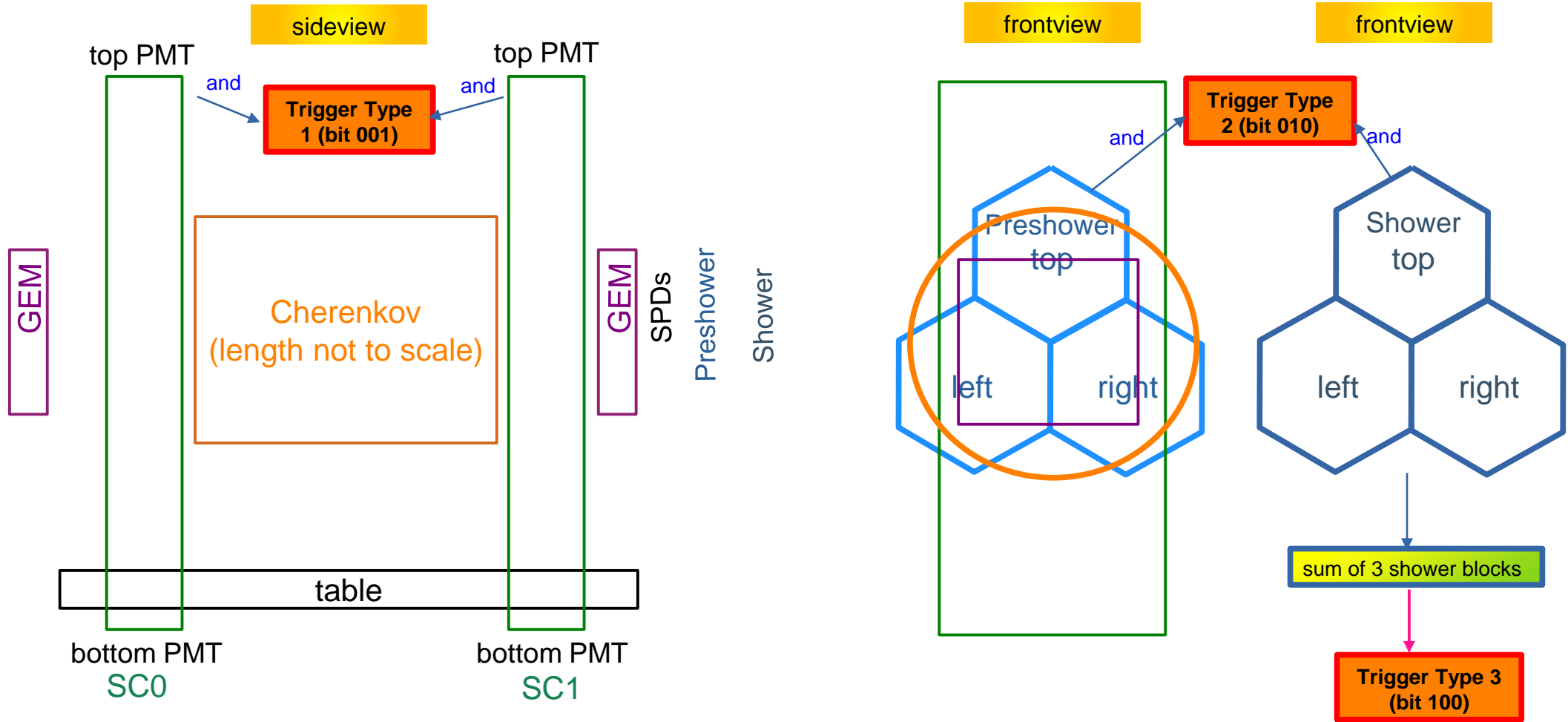
Jixie Zhang

Proposed SoLID BeamTest Setup, 2022

Incoming
Particles
→

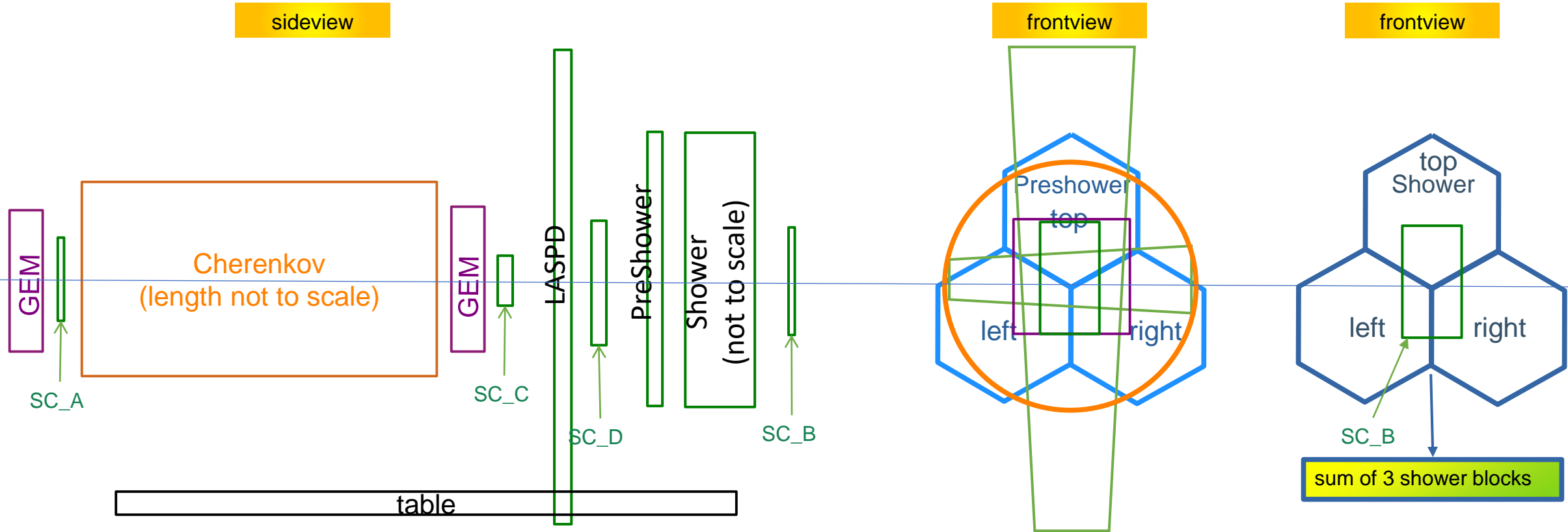


Low rate trigger setup (Hall C beam-left 82.2 deg)



All discriminator threshold is around 18.2 mV

High rate 7 deg detector layout (Hall C beam-right 7 deg)



List of Detectors (From upstream to downstream):

GEM_00, GEM01;

SC_A (5cm (x) x 7.5cm(y) x 1cm), Cherenkov;

GEM_10, GEM_11;

SC_C (trapezoid shape: 3.5cm wide top side (at end tip, in hall y direction) and 5.5cm wide bottom side (connected to light guide), 18cm height (in hall x direction), 2cm thick);

LASPD, SC_D (Kedi-6 preshower tile, 6.35cm side length hexagon, 2cm thick);

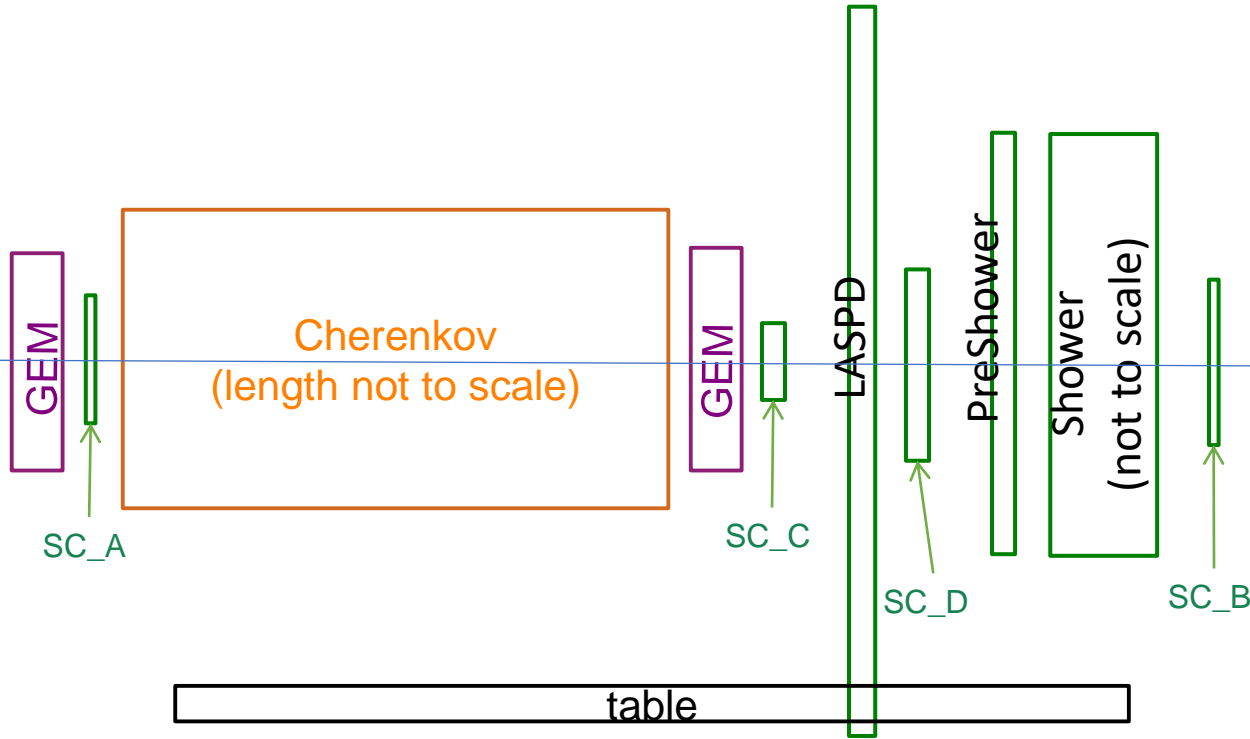
PreShower: Preshower_T(SDU#2), Preshower_left(SDU#1), Preshower_right(THU#1);

Shower: Shower_T(SDU#5), Shower_L(SDU#4), Shower_R(THU#4);

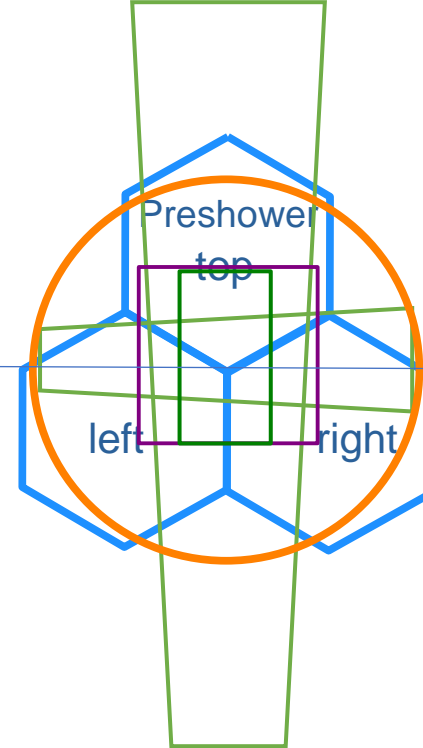
SC_B: (5cm(x) x 10cm(y) x 1cm)

High rate 18 deg detector layout (Hall C beam-right 18 deg)

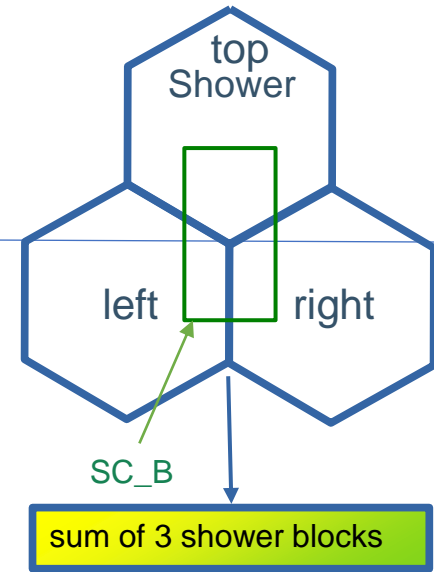
sideview



frontview



frontview



List of Detectors (From upstream to downstream):

GEM_00, GEM01;

SC_A (5cm (x) x 7.5cm(y) x 1cm), **Cherenkov**;

GEM_10, GEM_11;

SC_C (trapezoid shape: 3.5cm wide top side (at end tip, in hall y direction) and 5.5cm wide bottom side (connected to light guide), 18cm height (in hall x direction), 2cm thick);

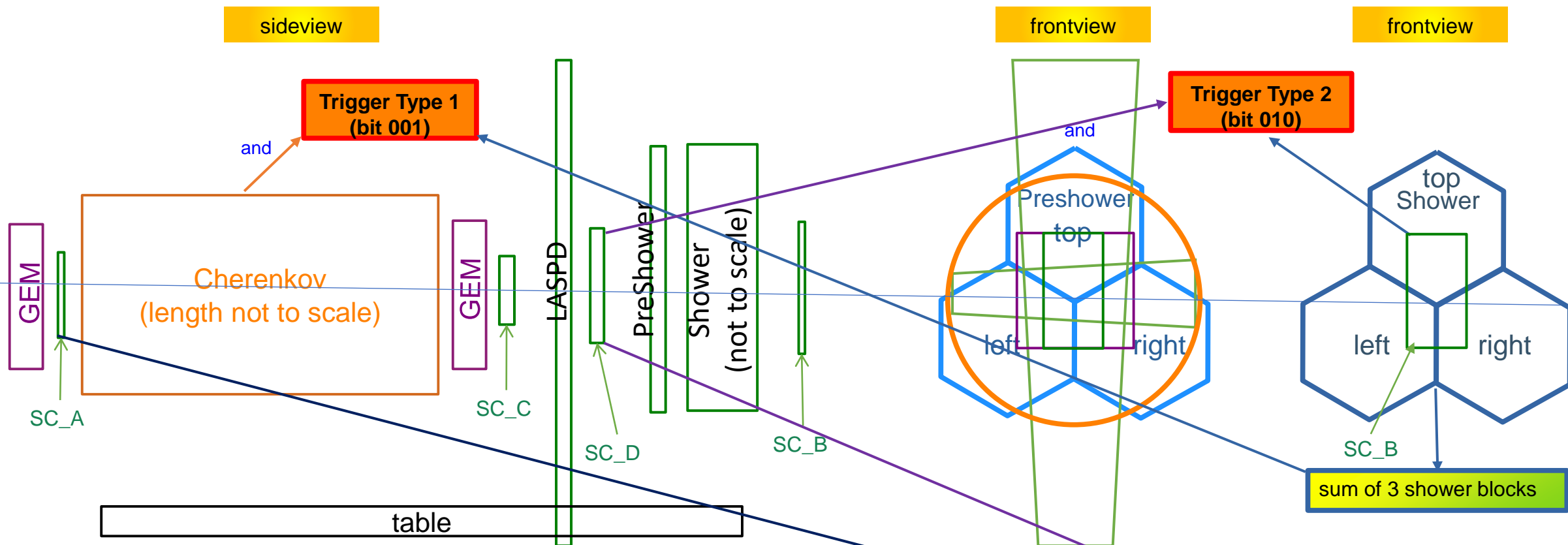
LASPD, SC_D (Kedi-6 preshower tile, 6.35cm side length hexagon, 2cm thick);

PreShower: Preshower_T(SDU#2), Preshower_left(SDU#1), Preshower_right(THU#1);

Shower: Shower_T(SDU#5), Shower_L(SDU#4), Shower_R(THU#4);

SC_B: (5cm(x) x 10cm(y) x 1cm)

High rate (current) detector layout (Hall C beam-right 18 deg)



List of Detectors (From upstream to downstream):

GEM_00, GEM01;

SC_A (5cm (x) x 7.5cm(y) x 1cm), Cherenkov;

GEM_10, GEM_11;

SC_C (trapezoid shape: 3.5cm wide top side (at end tip, in hall y direction) and 5.5cm wide bottom side (connected to light guide), 18cm height (in hall x direction), 2cm thick);

LASPD, SC_D (Kedi-6 preshower tile, 6.35cm side length hexagon, 2cm thick);

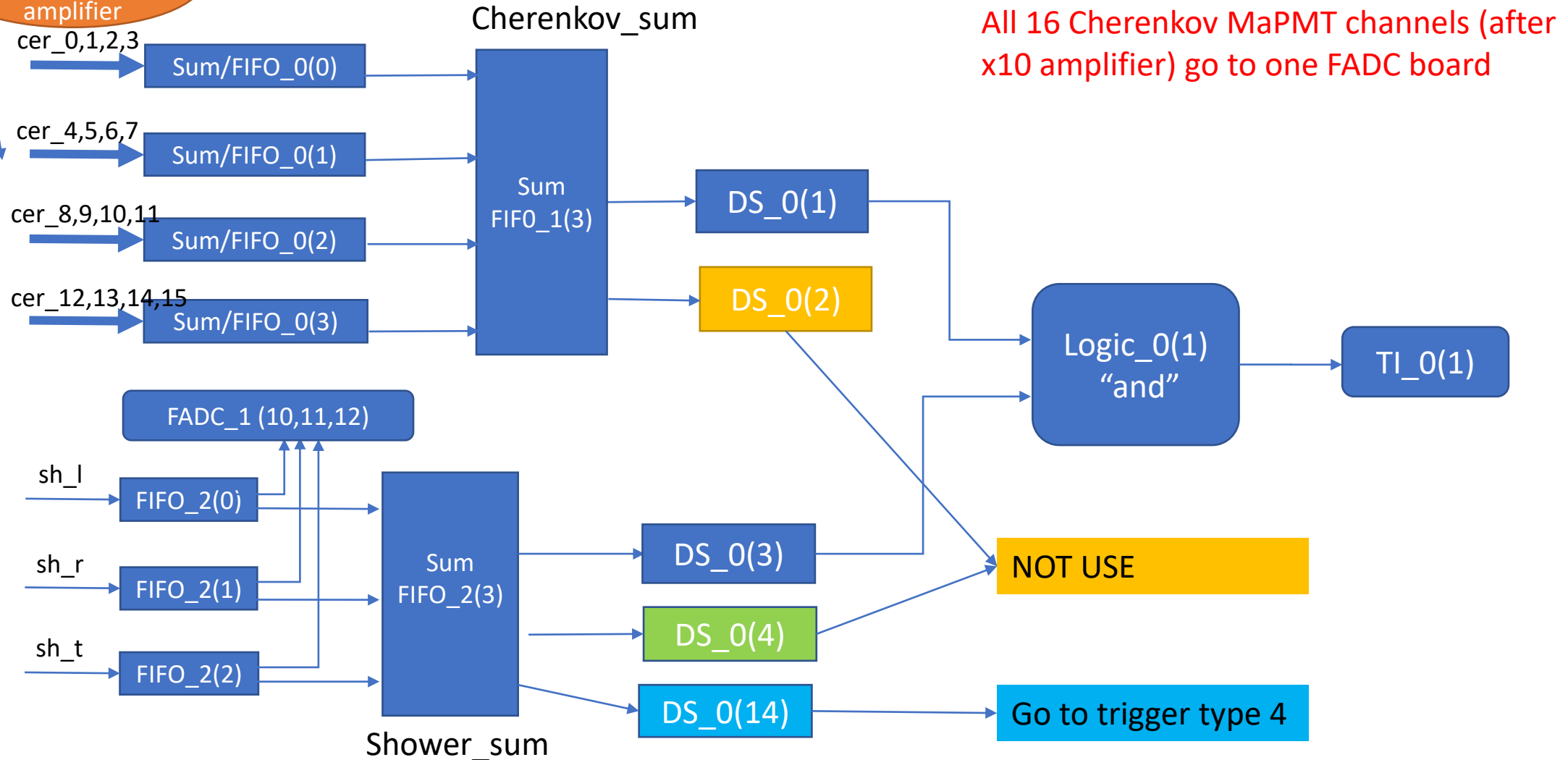
PreShower: Preshower_T(SDU#2), Preshower_left(SDU#1), Preshower_right(THU#1);

Shower: Shower_T(SDU#5), Shower_L(SDU#4), Shower_R(THU#4);

SC_B: (5cm(x) x 10cm(y) x 1cm)

High rate trigger type 1: primary electron trigger (sum_cer & sum_shower)

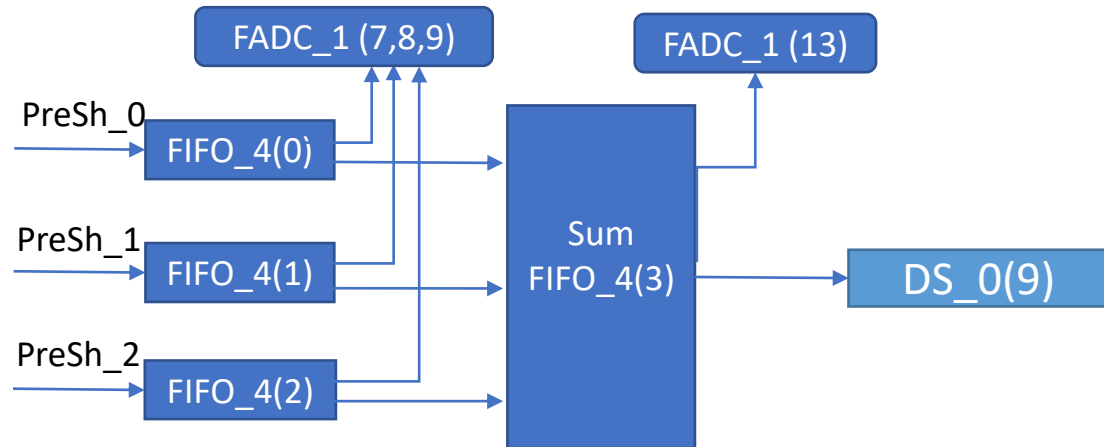
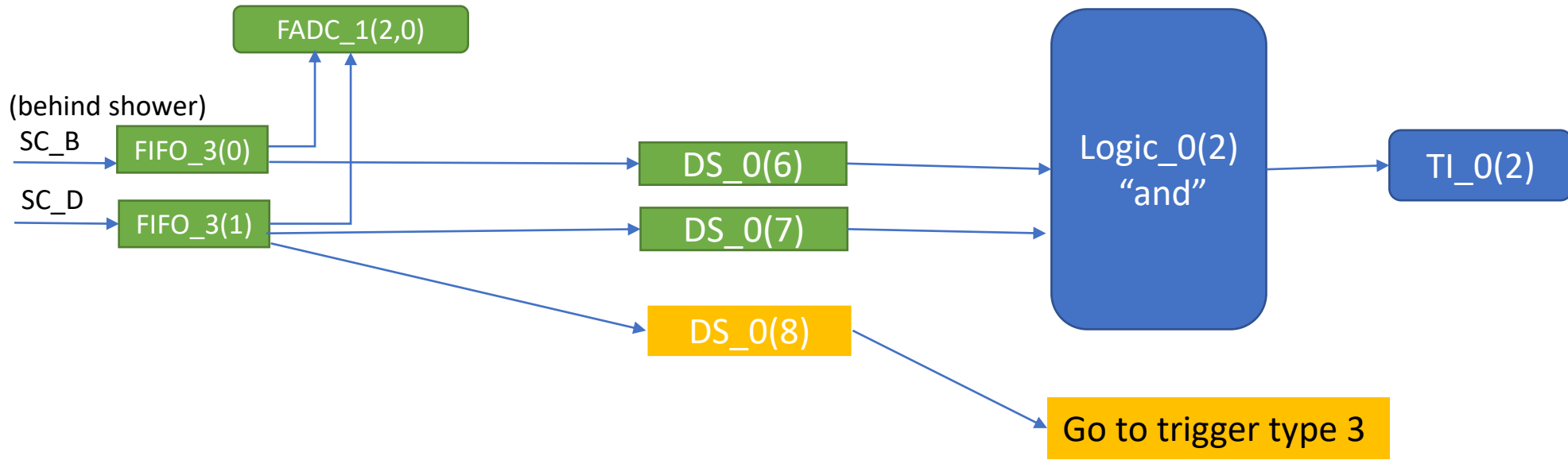
All inputs are after x10 amplifier



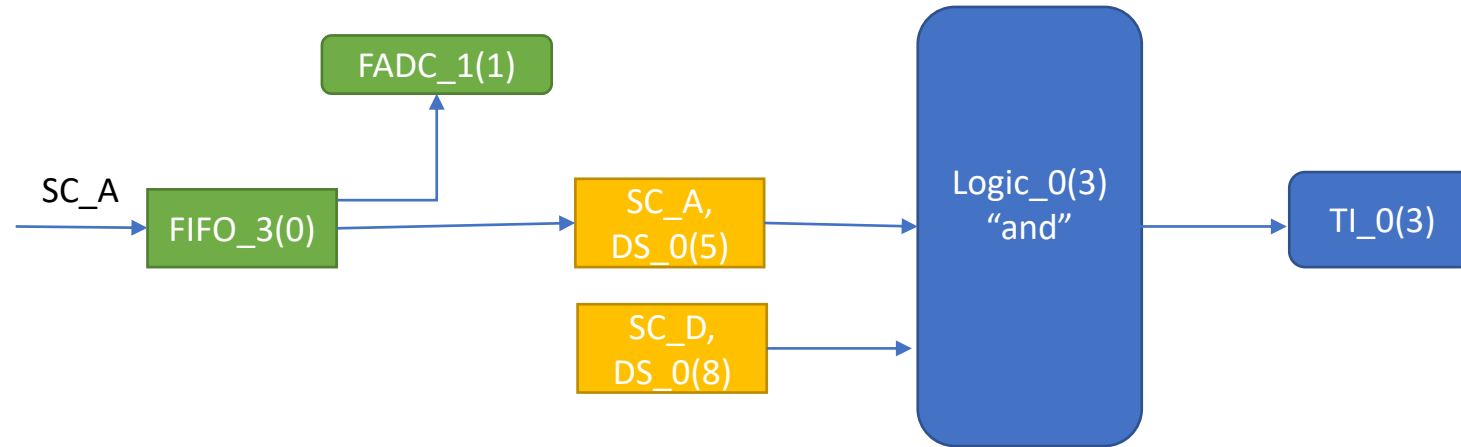
All 16 Cherenkov MaPMT channels (after x10 amplifier) go to one FADC board

Separate each DSC channel for different threshold control to each trigger type

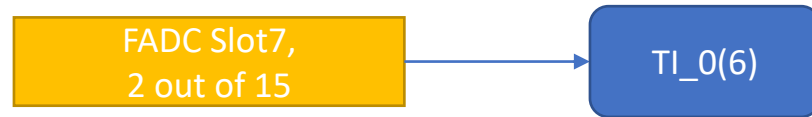
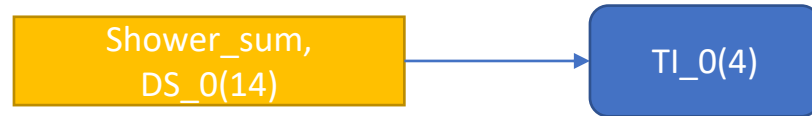
High rate trigger type 2: pion trigger (scintillators ...)



High rate trigger type 3:



High rate trigger type 4,6:



TS6 is about 240ns time later than trigger type 1-4. It can not replace Cherenkov sum before aligning trigger type 1-4 to it.

Back up

MODEL 740 QUAD BIPOLAR LINEAR FAN-IN/FAN-OUT

(Front Panel Description)

Standard #1 NIM Packaging
in accordance with
TID-20893

Four Linear Inputs; Accepts
Up to ± 2.5 Volt Signal Levels;
50 Ohm Impedance; Direct
Coupled.

Four Linear Outputs; Each Capable
of Delivering ± 2.5 Volts Across
50 Ohm Load; Non-Inverting.

Test Point Provides Easy
Monitoring of Output DC Offset.

Output DC Offset Control; 15-turn
Screwdriver Adjustment, Variable
Over $\pm .5$ Volt Range.

Two Inverted Linear Outputs;
Each Capable of Delivering ± 2.5
Volts Across 50 Ohm Load.

Voltage and Current
Requirements



CAEN N625

