VMM and the SRS - update

Michael Lupberger



Outline

• Summary from last presentation at Aveiro

• Progress

Outlook



Summary slide of presentation in Aveiro

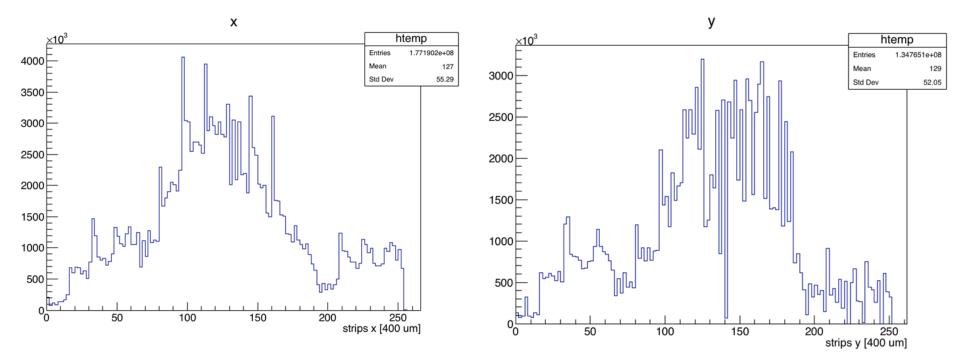
- Permanent test setup in GDD lab
- Powering through SRS DCard is challenging
- New wire-bonded VMM2 hybrid works

Outlook:

 Get ready to read out an ESS prototype detector with VMM at test beam in October



Thermal neutron beam test at IFE/Norway Oct/Nov 2016

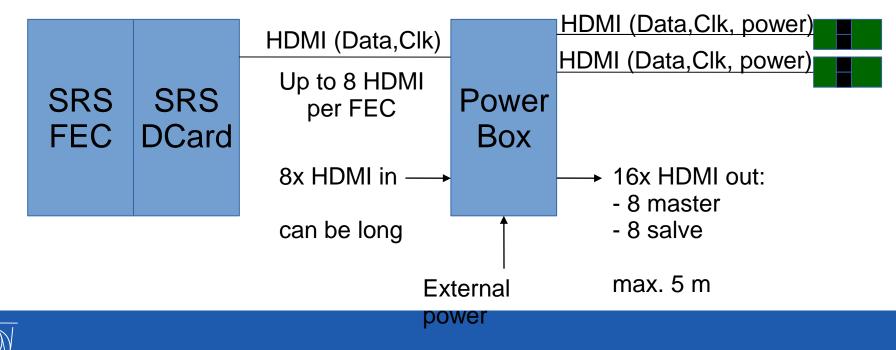


- Data taken with a 10 cm x 10 cm Gd-GEM with a trigger rate of 8 kHz
- Clustering has to be done based on BCID and TDC
- Trigger rate of 9.8 kHz necessary to avoid overflow of BCID with 40 MHz clock



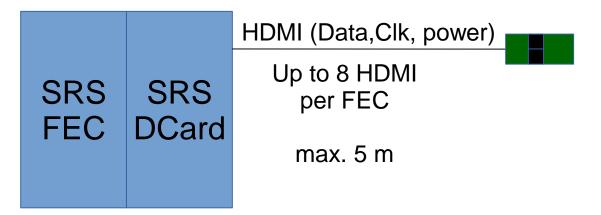
Progress: Powering

- Powering through SRS DCard is challenging
- \rightarrow can only be done with short (<5m) HDMI cables
- \rightarrow new powering scheme:



Progress: Powering

- Powering through SRS DCard is challenging
- \rightarrow can only be done with short (<5m) HDMI cables
- \rightarrow old powering scheme still possible:





Progress: Wire bonded VMM2 hybrid

- New wire-bonded VMM2 hybrid works
- Used at ESS test beam at IFE
- in Oslo for a short time test
- (limited beam time)
- \rightarrow need cooling



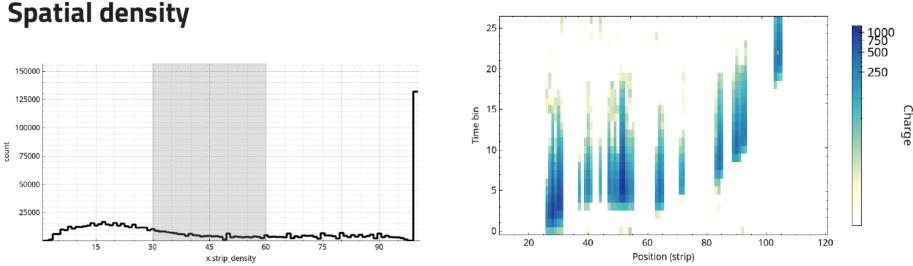
→ need dedicated DAQ Software (thanks George, Dan for providing the "work in progress" NSW VMM software.



Ongoing:

Software development:

- Online monitoring, data acquisition, slow control
- \rightarrow help from ESS/BrightnESS partners
- e.g. Martin Shetty: Online Monitoring, Data analysis



Spatial density is defined as percentage of valid strips out of the total strip span. Such events are either very noisy or likely indicate a high energy conversion electron.



Ongoing:

Software development:

- Online monitoring, data acquisition, slow control
- \rightarrow help from ESS/BrightnESS partners
- e.g. Morten Jagd Christensen: Fast UDP socket



Ongoing:

Software development:

- Online monitoring, data acquisition, slow control
- \rightarrow help from ESS/BrightnESS partners
- I am currently working on the slow control, George/Dans tool as starting point
 I am currently working on the slow control, George/Dans tool as starting point

Control	Global Registers	
		Channel R Calibration Response
IPs 10 0 2 FECs 0 2 Open Communication N/A	Ch. polarity negative - Analog tristates Off -	SP SC SL ST SM 0 m + SMX 0 ns + 0 ns + 0 ns +
Command Channels	Gain (sg) 3.0 mV/ft 👻 TAC Slop Adj 125 ns 👻	1 jegative 0 m v 0 ns v 0 ns v
○ APP ○ EEC VMN HDMI 1 2 ART	Neighbor Trigger (Off 💌 Disable At Peak Off 💌	2 hegative 0 m v 0 ns v 0 ns v
O S6 ● SPI 1 ✔ ✔ ✔ O Read ● Write 2	Leak. Curr. Enabled 💌 Double Leak On 💌	3 hegative 0 m v 0 m v 0 ns v 0 ns v 4 hegative 0 m v 0 m v 0 ns v 0 ns v 0 ns v
Send Somm 3	Peak time (st) 200 ns 👻 Sub Hysterisis Off 👻	5 hegative
Trigger_Acquisition 5	ART On V Mode Timin V Dual Clock Off V	6 hegative
TP Delay BCID Reset 6 81 ♦ 0 ♦ 7 1000 ₽	sbfm Off - sbfp Off - sbft Off -	7 hegative 0 m \ ▼ 0 ns ▼ 0 ns ▼ 0 ns ▼ 8 hegative 0 m \ ▼ 0 ns ▼ 0 ns ▼ 0 ns ▼
61A80 100 \$ 8	Ch. Mon 1 (P - SCMX Off - SBMX Off -	9 tegative 0 ml v 0 ns v 0 ns v
ACQ Win Hold Off Set Mask	ADCs Enable V	10 hegative 0 m v 0 m v 0 ns v 0 ns v 11 hegative 0 m v 0 m v 0 ns v 0 ns v 0 ns v
Pulser ACQ On Link Status	Direct Time Off v Mode 0 v 0 v	
External ACQ Off Reset Links	8-bit Conv. Mode On v 6-bit Off v	13 hegative 0 m v 0 ns v 0 ns v
Frame - Trigge - High Res Set	10b ADC 20(- 8b ADC 10(- 6b ADC Lov -	14 hegative 0 m ⋅ ▼ 0 ns ▼ 0 ns ▼ 0 ns ▼ 15 hegative 0 m ⋅ ▼ 0 ns ▼ 0 ns ▼ 0 ns ▼
Resets		
Reset VMM2 WarmInit FEC Reboot FEC	Dual Clock Data Off - Dual Clock 6-bit Off -	
CKTK CKBC CKBC skew	Threshold DAC 300 🗘 269.34 mV	18 hegative 0 m v 0 ns v 0 ns v
0 ns 🔻 80MHz 👻 0 ns 👻 Set	Test Pulse DAC 300 269.34 mV	19 hegative 0 m v 0 ns v 0 ns v
✓ VMM Auto Reset TK Pulses Period		20 hegative 0 m v 0 ns v 0 ns v
	Load DAQ Config Write DAQ Config	21 hegative 0 m v 0 ns v 0 ns v
Test Pulse Skew Width Polarity	Use Mapping	22 hegative 0 m v v 0 ns v 0 ns v
	Monitoring	23 hegative 0 m/ - 0 m/ - 0 ns - 0 ns -
Ons v 128x25i v Positive v Set		24 regative 0 mV - 0 ns - 0 ns - 0 ns -
		25 hegative 0 m/ - 0 m/ - 0 ns - 0 ns -
Run Number 0 Angle 0 Even	ear Counters Trigge 0 It Sto -1 Hits 0	26 hegative 0 m/ ▼ 0 ns ▼ 0 ns ▼
Directory	Start Run Stop Run Ignore 16	27 hegative 0 m v 0 m v 0 ns v 0 ns v 0 ns v 28 hegative 0 m v 0 m v 0 ns v 0
Comments	N/A Trigger Data Enable Debug	



Ongoing: VMM3 hybrid

- Alex is working on it, about to be finished
- Will use wire bonded VMM3

• Reminder: VMM3 hybrid will have new connector! FX10A-140S14-SV on Detector, FX10A-140P14-SV1 on hybrid (there will be an adapter to the current samtec connector)

