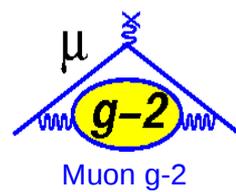




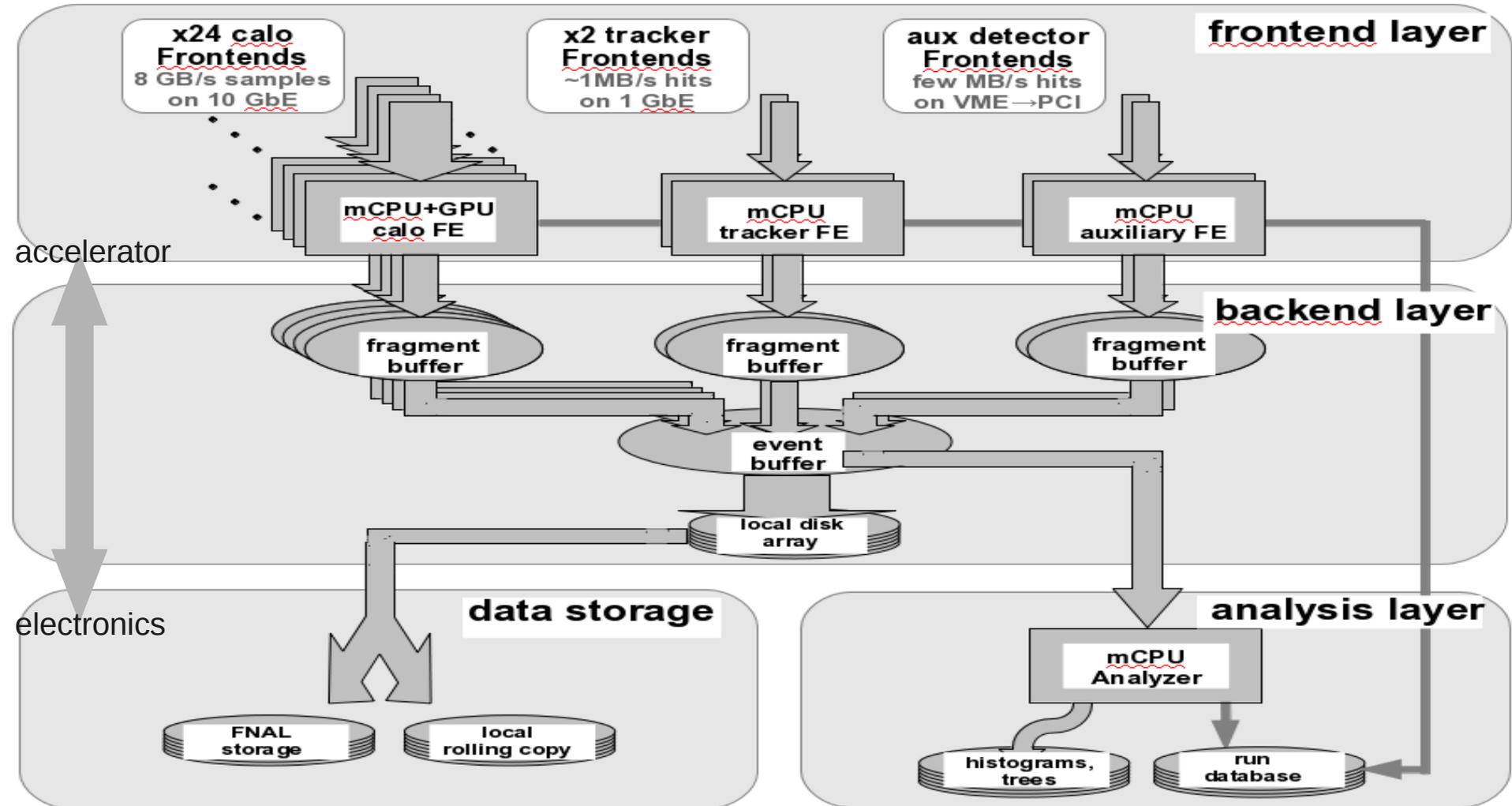
Status of DAQ prototyping (for CDR to TDR)



Tim Gorringer, Dec 11-13,
g-2 collaboration meeting.

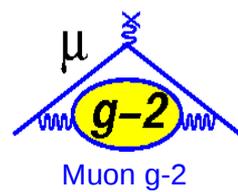
- **layout, rates, etc**
- **test stands**
- **Prototyping - ongoing work**
- **Prototyping - future work**

Status of DAQ prototyping – overall layout

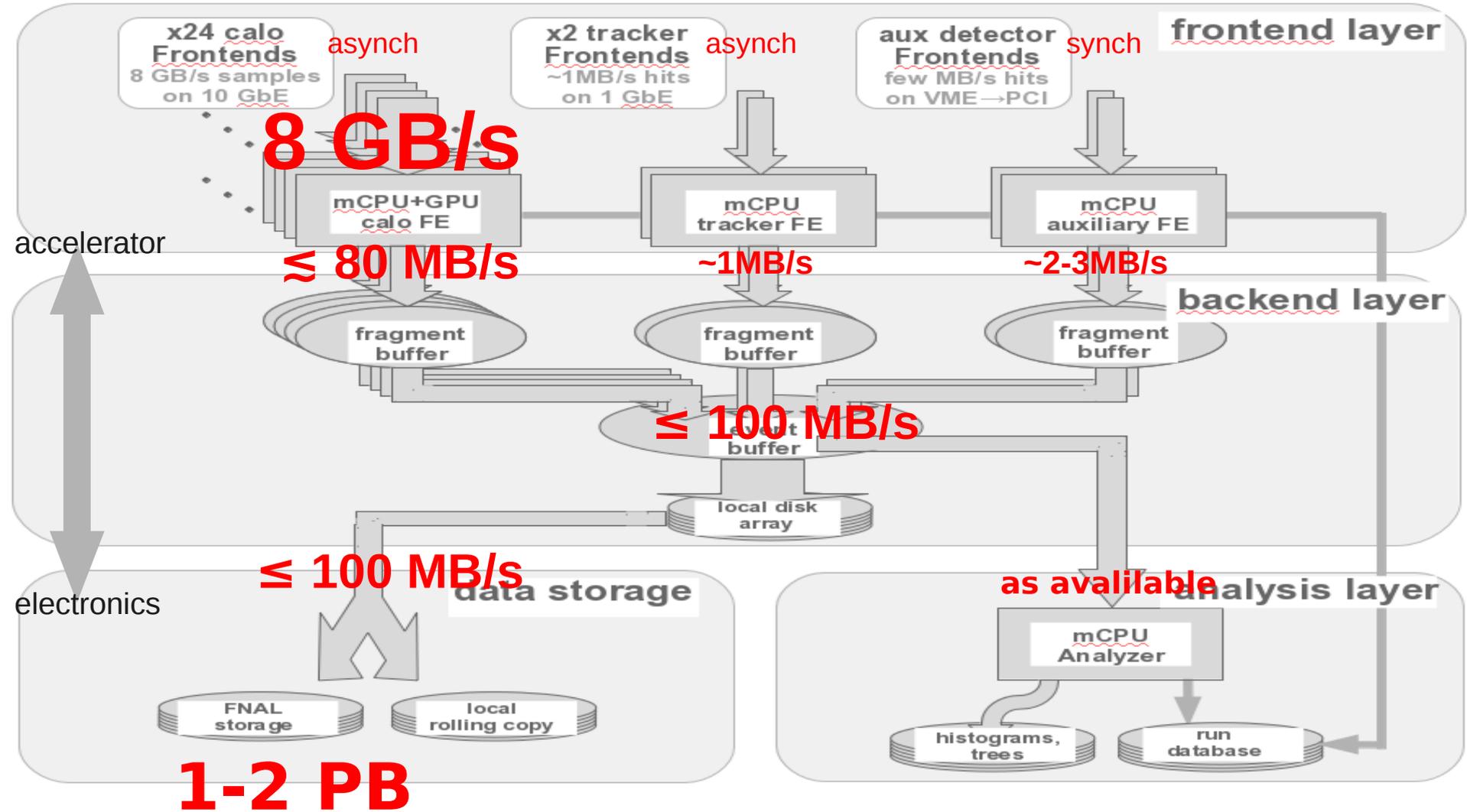


Distributed, layered DAQ, using commodity processors GPUs, and MIDAS framework

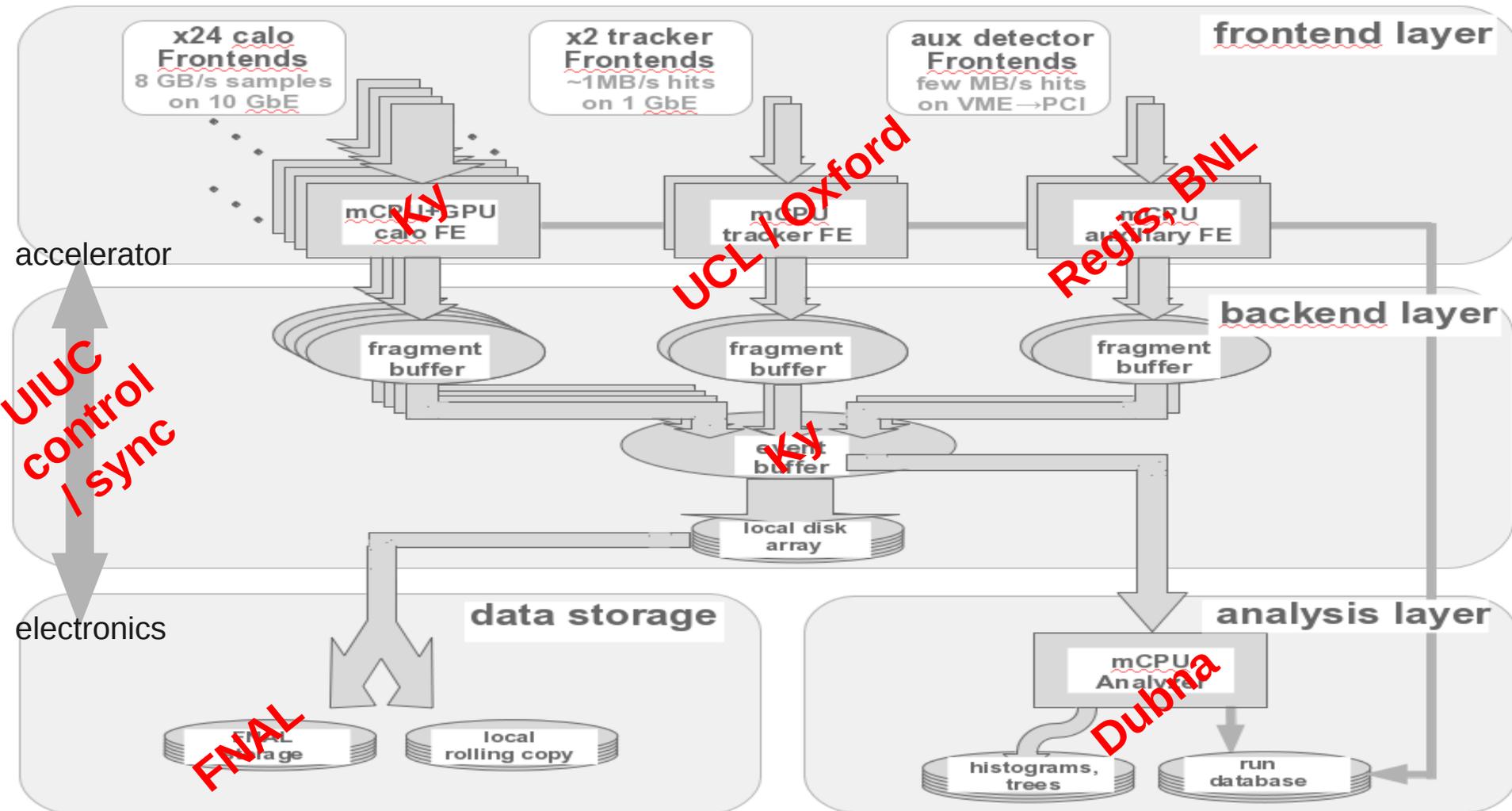
Status of DAQ prototyping – rates, volumes



12Hz fills in bunches of 4 fills with 11ms intervals



Status of DAQ prototyping for DAQ->TDR

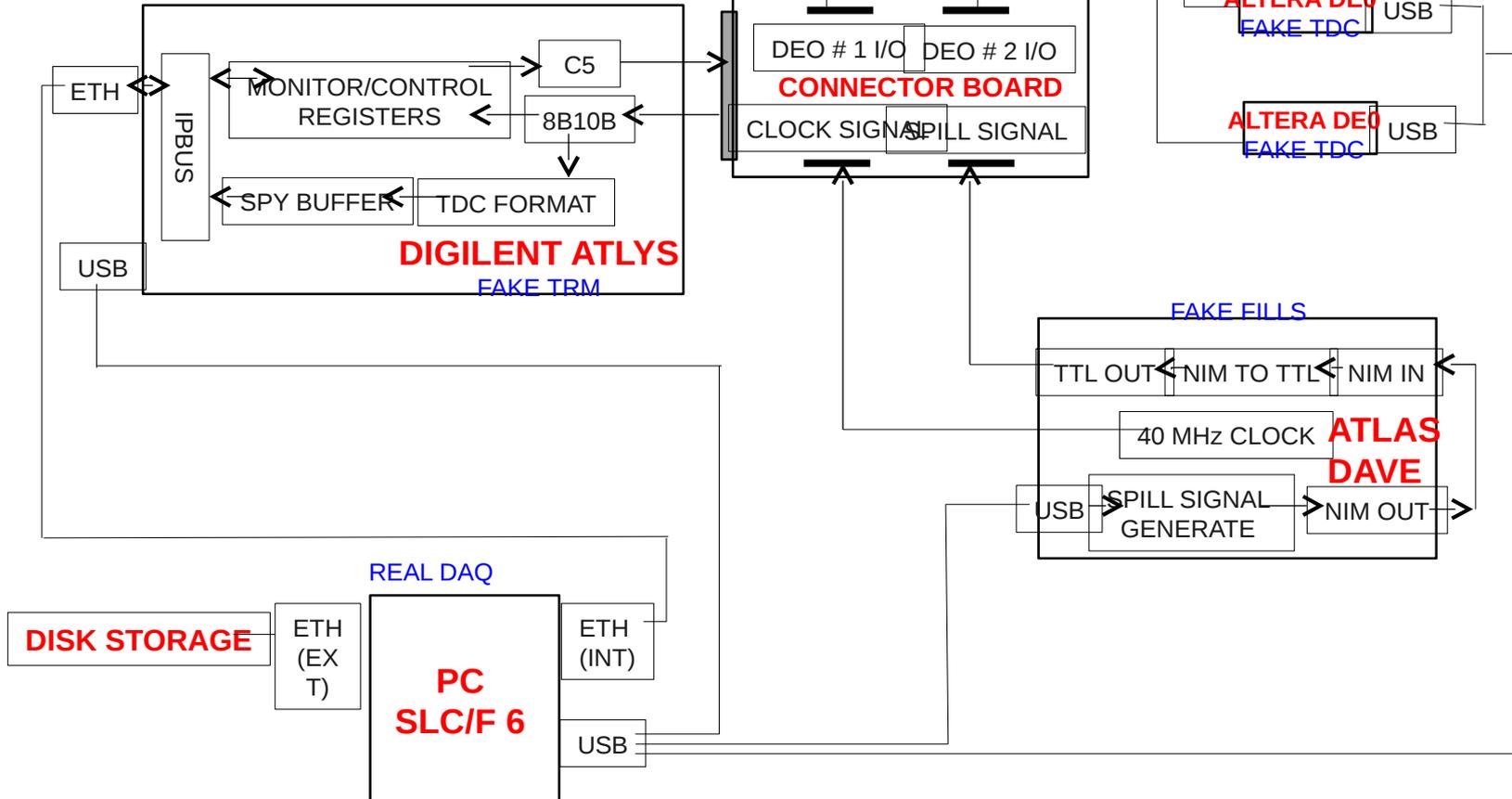


+ Donatella Toretta (MIDAS support) + Rennie Scott (computer support)

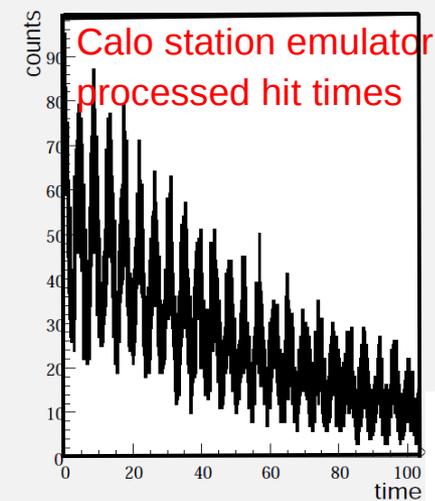
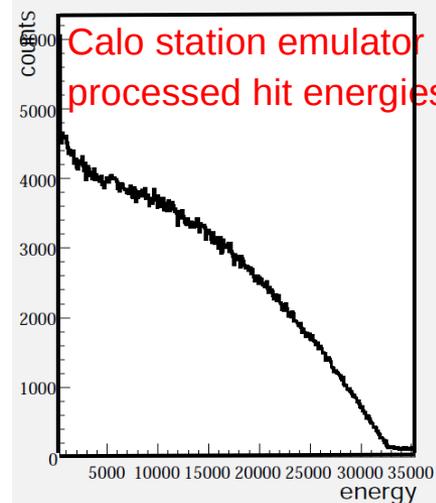
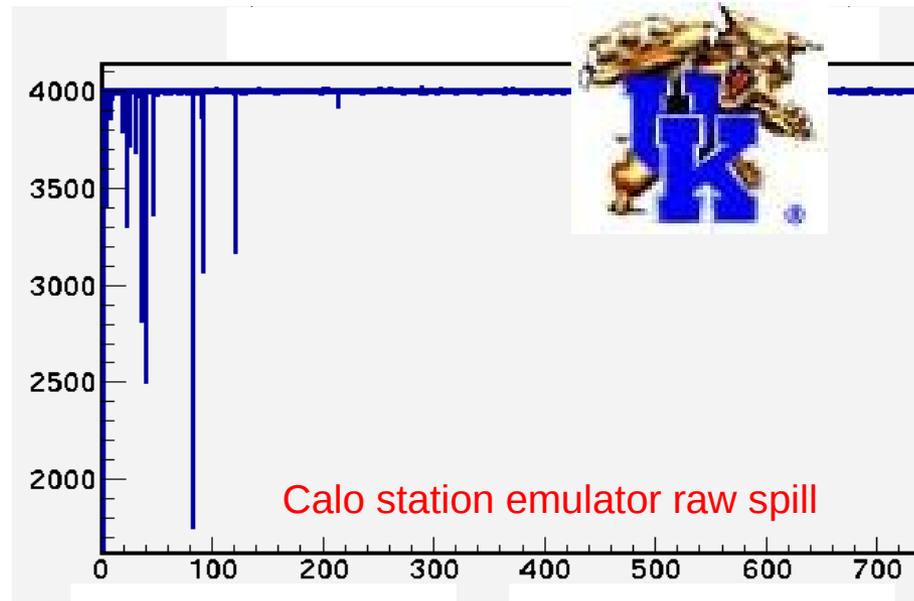
DAQ prototyping - UCL test stand



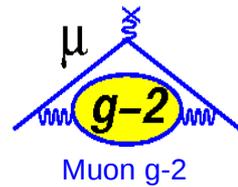
Muon **A**TLYS **T**RM **T**DC



DAQ prototyping - KY test stand



Status of DAQ prototyping – things done



Tracker FE

- **C5/8B10B control / data transfer** between TDC and TRM (development, testing)
- **IPBus communication** between TRM and tracker DAQ (development, testing)
- **Tracker DAQ** (C++ ,IPBus , ROOT) for DAQ<->TRM<->TDC control / readout (development, testing)
- **Tracker readout** redmine project / git repository (setup)

Calo FE

- **10 GbE data transfer** from calo emulator to MIDAS readout frontend (timing tests, optimization studies)
- **IPBus reads/writes** between IPBus emulator and MIDAS readout frontend (development, testing)
- **GPU-based T, Q method algorithms** (integrity tests, timing tests, GPU comparisons)
- **Tracker readout** redmine project / git repository (setup)

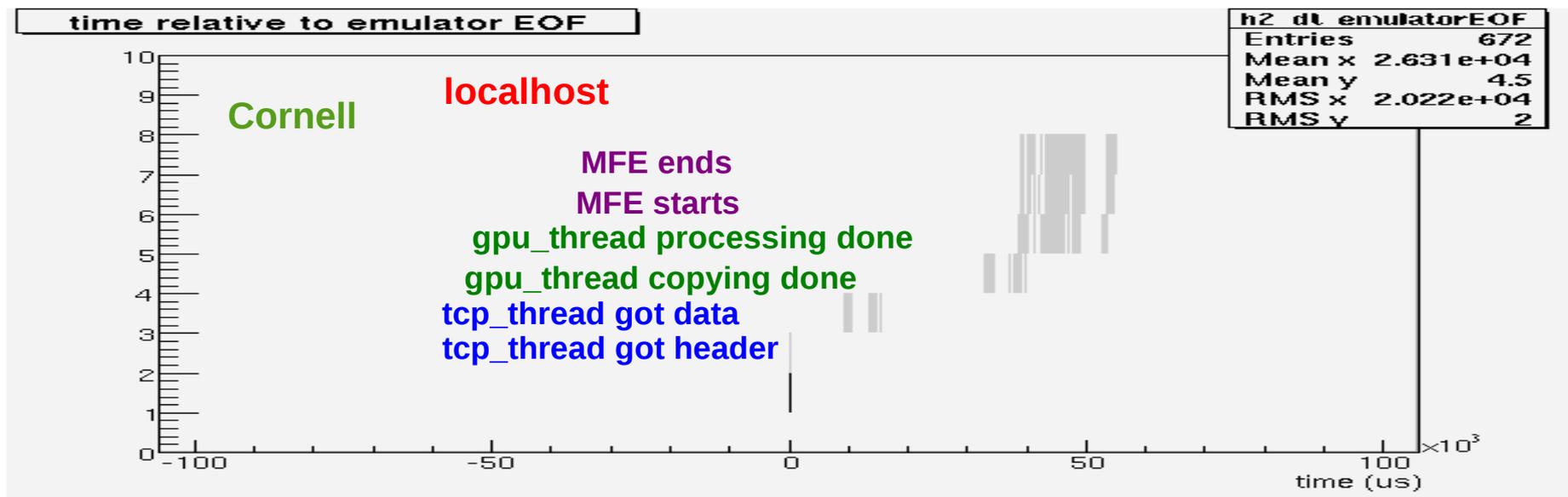
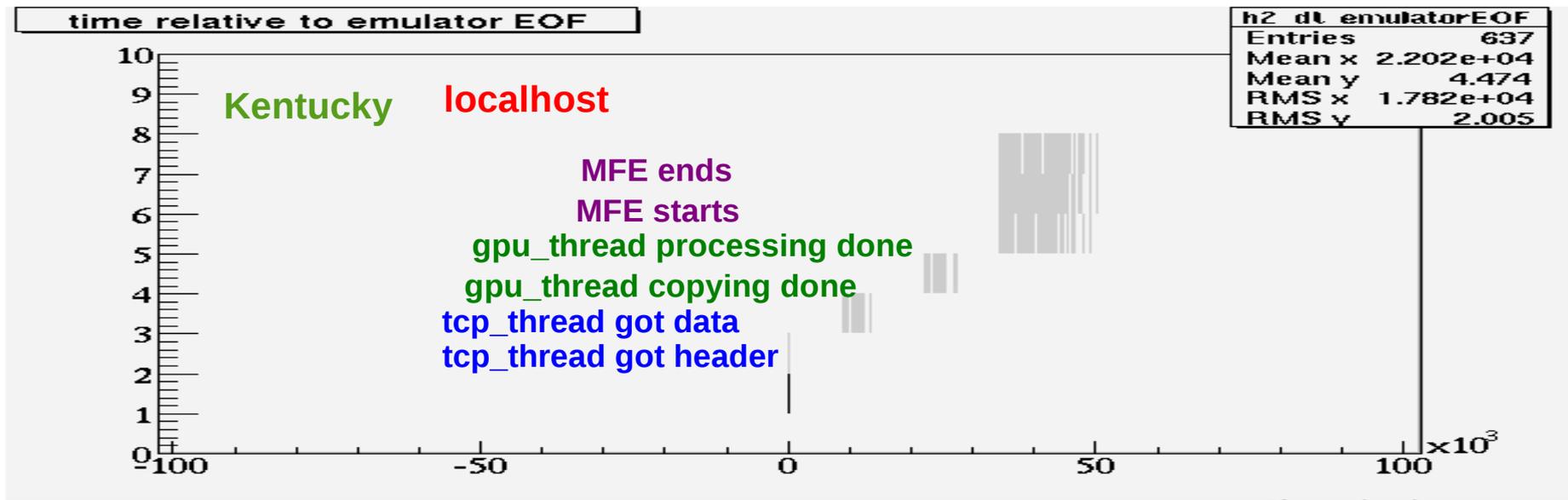
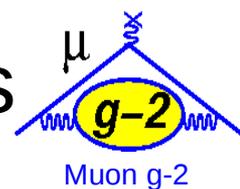
Control

- **Software control system prototype** for synchronous, asynchronous MIDAS frontends (development, testing)

Event building

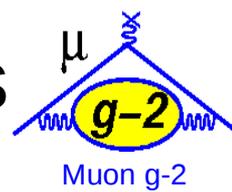
- **MIDAS event building** with large numbers of data fragments (integrity tests, rates tests)

DAQ prototyping – calo readout rate tests





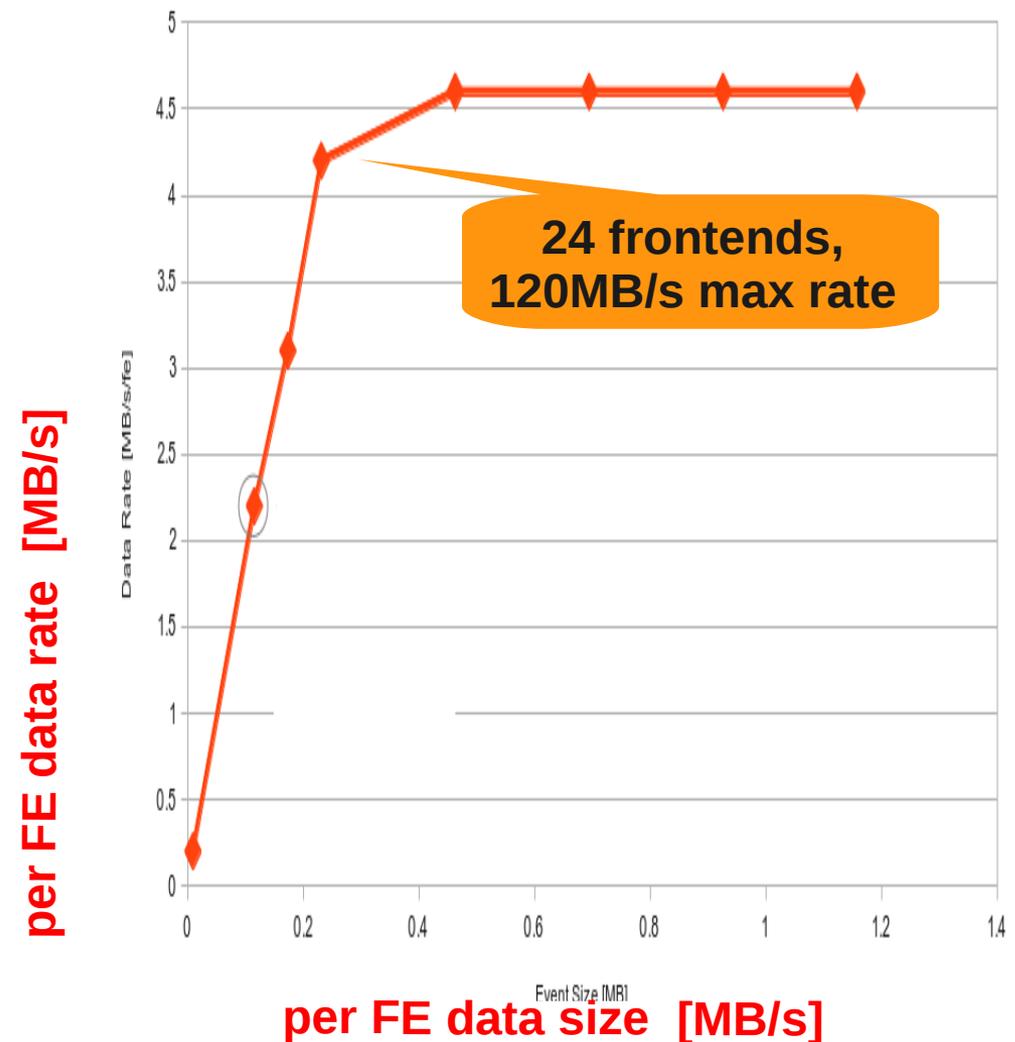
DAQ prototyping - event building rate tests



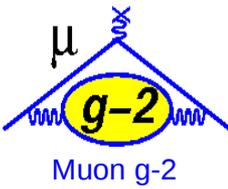
MIDAS experiment "UKY"		Wed May 29 20:08:06 2013		Refr:60	
Stop	ODB	Messages	Alarms	Programs	Config
RunLog	Logbook	Elog	Doc		
Run #2071	Running	Alarms: On	Restart: No	Data dir: /data/UKY/mid	
Start: Wed May 29 20:07:16 2013		Running time: 0h00m50s			
Equipment	Status	Events	Events[/s]	Data[MB/s]	
MagicBox	magic_box@mb	0	0.0	0.000	
VMEcrate	(frontend stopped)	0	0.0	0.000	
masterMT	(frontend stopped)	365	0.0	0.000	
EB	Ebuilder@be	0	0.0	0.000	
ATS9870	(frontend stopped)	0	0.0	0.000	
EMC	(frontend stopped)	5	0.0	0.000	
master	master@fe02	574	11.9	0.001	
FakeCalo01	(frontend stopped)	0	0.0	0.000	
FakeData01	FakeData01@fe01	564	12.0	2.058	
FakeData02	FakeData02@fe01	578	12.0	2.057	
FakeData03	FakeData03@fe01	555	12.0	2.053	
FakeData04	FakeData04@fe01	566	12.0	2.059	
FakeData05	FakeData05@fe01	575	11.7	2.002	
FakeData06	FakeData06@fe01	551	12.0	2.058	
FakeData07	FakeData07@fe01	564	12.0	2.059	
FakeData08	FakeData08@fe01	576	12.0	2.059	
FakeData09	FakeData09@fe01	551	11.6	1.999	
FakeData10	FakeData10@fe01	563	12.0	2.059	
FakeData11	FakeData11@fe01	573	12.0	2.059	
FakeData12	FakeData12@fe01	551	11.9	2.052	
FakeData13	FakeData13@fe01	561	12.0	2.058	
FakeData14	FakeData14@fe01	571	12.0	2.057	
FakeData15	FakeData15@fe01	547	12.0	2.060	
FakeData16	FakeData16@fe01	558	12.0	2.059	
FakeData17	FakeData17@fe01	570	12.0	2.057	
FakeData18	FakeData18@fe01	544	12.0	2.057	
FakeData19	FakeData19@fe01	555	12.0	2.057	
FakeData20	FakeData20@fe01	567	11.6	1.997	
FakeData21	FakeData21@fe01	578	12.0	2.059	
FakeData22	FakeData22@fe01	555	12.0	2.060	
FakeData23	FakeData23@fe01	567	12.0	2.059	
FakeData24	FakeData24@fe01	578	12.0	2.059	
FakeCaloNewQ01	(frontend stopped)	0	0.0	0.000	
CaloSimulatorTCP/IP01	(frontend stopped)	0	0.0	0.000	
CaloReadoutTCP/IP01	(frontend stopped)	0	0.0	0.000	
Channel	Events	MB written	Compression	Disk level	
#0: run02071.mid	579	99.383	N/A	63.9 %	

20:07:17[mtransition,INFO] Run #2071 started

DAQ data rates



DAQ prototyping – near future



- **WFD + AMC13 in mTCA crate readout**
- **TDC + TRM + AMC13 in mTCA crate readout**
- **Control system design, development, interfacing of electronics, accelerator, daq signals**
- **tracker beam tests, calo beam tests**
- **GPU optimization, T/Q algorithm development**
- **Planning / development for event displays, data monitoring, experiment database**