NPS DAQ equipment update

October 18th 2018

VTP

- VTP readout
  - VME backplane limited to 100 MB/s
  - Development of parallel readout of FADC through serial link = 16x 125 MB/s
  - good option for cluster readout (read all FADC and only transfer clusters)
  - Development of streaming option
  - Would be safer to have VTP readout of FADC for NPS in case we need to record full waveform and have higher than expected trigger rate

Cost estimates total

	Number needed	Unit price K$			
FADC	70	4	280		
VXS	5	15	75		
SD	5	4	20		
TI	5	4	20		
CPU	5	4	20		
VTP	5	7	35		
		Total	450	No FADC cost	170

Cost estimates total reuse SHMS

	Number needed	Unit price K$			
FADC	43	4	172		
VXS	3	15	45		
SD	3	4	12		
TI	3	4	12		
CPU	3	4	12		
VTP	5	7	35		
			288	No FADC cost	116
				No trigger	81

Updated remaining costs

- 1 VXS crate for APEX / Hall C
- 2 FADC ordered
- Most likely enough FADCs

	Number needed	Unit price K$			
FADC	41	4	164		
VXS	2	15	30		
SD	3	4	12		
TI	3	4	12		
CPU	3	4	12		
VTP	5	7	35		
			265	No FADC cost	101
				No trigger	66

Test setup SHMS

- 1 VXS crate with available FADC slots in SHMS
- 2 FADC ordered
- Cables budgeted but not sure when it will be done : need to run 16 BNC cables to SHMS nose
- Test background, FADC in standard Hall C DAQ can take small acceptance DVCS
- Goal : pile-up timing resolution

Cables

- 1116 cables from patch to SHMS hut
- Budgeted for 2018

Conclusion

- A few pieces of hardware required for running
  - get a bit every year
  - or make large order
    - 2 x (VXS crates+CPU+TI+SD)
- If want calorimeter trigger
  - order VTP : additionnal cost possibility of fast readout
  - reuse old CTP,GTP (Hall D, Hall B might upgrade to VTP)
  - order of VTP coming up soon
- Beam test : 16 channels FADC and 16 cables to be pulled
  - occupancies
  - effect of pile-up
  - Timing resolution
  - Data rates
  - Resolution
  - Radiation damage