PANDA FEE Survey

Subsystem : MVD pixel

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	Addressed and understood	**Under study**
Detector capacitance	100 fF (?)	
Detector signal shape and fluctuations	δ-like	
Signal polarity	p-in-n	
Leakage current, if any		< 13 nA/pixel after irr < 40 nA for border pixel

	Addressed and understood	**Under study**
Event rate per channel.		6.1×10^{6} Hits/cm^2·s <2.5 ÷ 4.5 kHits/s
Time resolution.		6.43 ns or 12.86 ns (pk-pk) 1.86 ns or 3.71 ns (r.m.s.)
Time extraction method.	Clock-based counter	
Required precision for synchronization (SODA).		Total jitter < 10 ps
Available space on the front-end electronics for synchronization piggy-back card		Not in the cavern
Amplitude/energy resolution if any		200 e- up to 50 fC
Energy extraction method (e.g. ToT, ADC, etc)	ToT	
FEE support/need for online calibration		???
FEE support for online event selections		???
Data format and abstraction levels (Hits, Clusters,Energies, Pattern, Rings...)		Raw data
Limit on power consumption.		< 800 mW/cm^2

	Addressed and understood	**Under study**
System modularity/granularity.	Modules of 2-4-5-6 FE ASICs – 12760 pixels per ASIC.	# of GBT boards per module and position under study. >1000 GBT boards
Power distribution/management (number of regulators, distance between the last regulators and the front end, number of power cables, grounding scheme...)		Based on (radtol) DC-DC converters. Converters position to be fixed.
Data transmission scheme	Optical, based on the GBT project	
Data concentrator cards (intended as the intermediate layer interfacing the front-end to DAQ)		based on µTCA card, with 3×3.2 Gb/s inputs and 1×10 Gb/s output.
expected number of data concentrator cards (~# of SODA inputs)		Under study
number of optical fibres to the burst-building network (compute nodes)		Under study
amount of the configuration data required by the front-end:	~20 Mbytes	
should be distributed by SODA?		This decision should be common to all sub-detectors
Requirement for a low-latency watch-dogs in the system front-end - data concentrator		????
Level of radiation protection foreseen (total dose and SEU).	100 kGy	SEU under study