Status Report on the FE electronics

ASICs version-2 vs version-3

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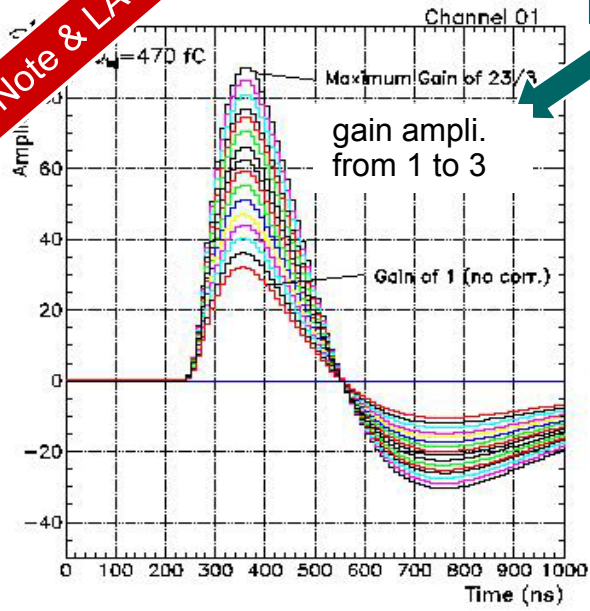
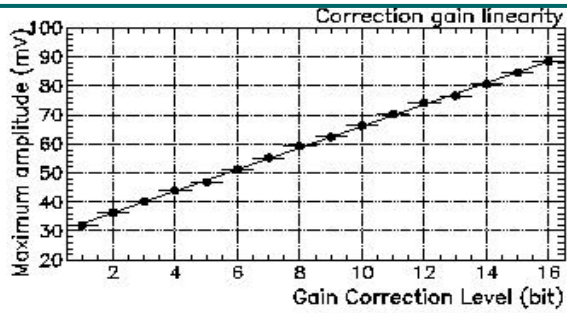
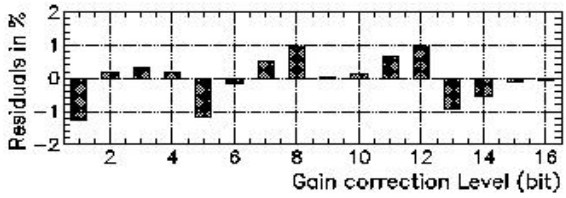
Note & LAL Report being released

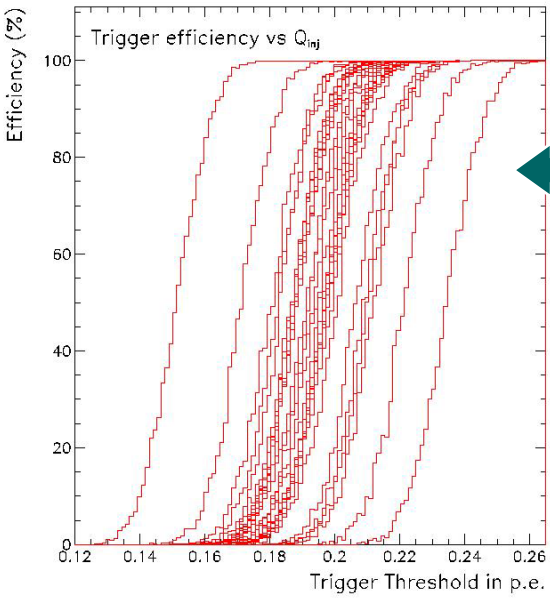
FE electronics: Version2

Variable Gain Preamplifier fully functional

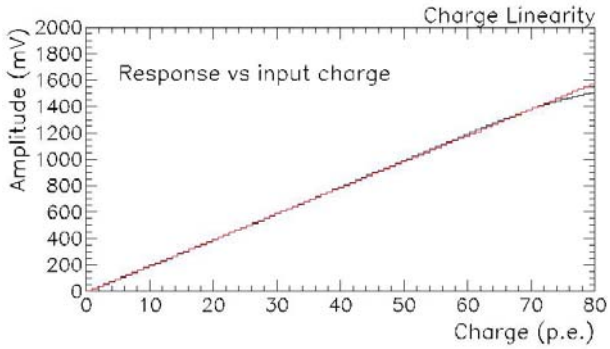




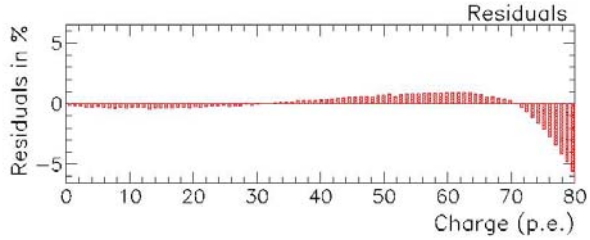




100% trigger efficiency for T>0.3 p.e.



Good Linearity over [0-75] p.e. range

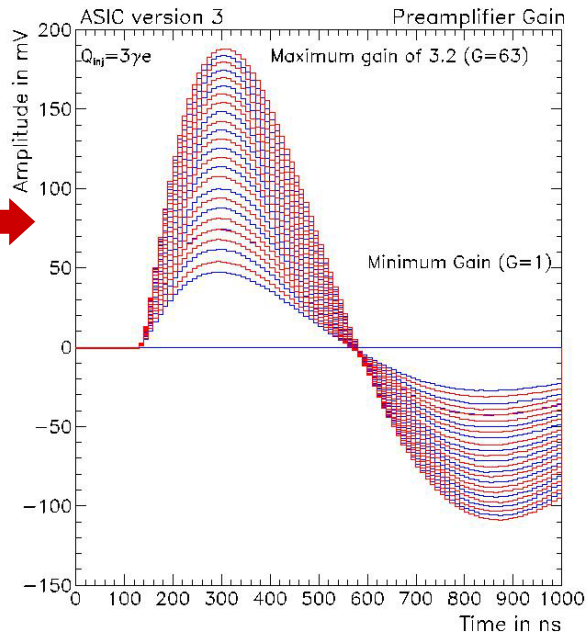


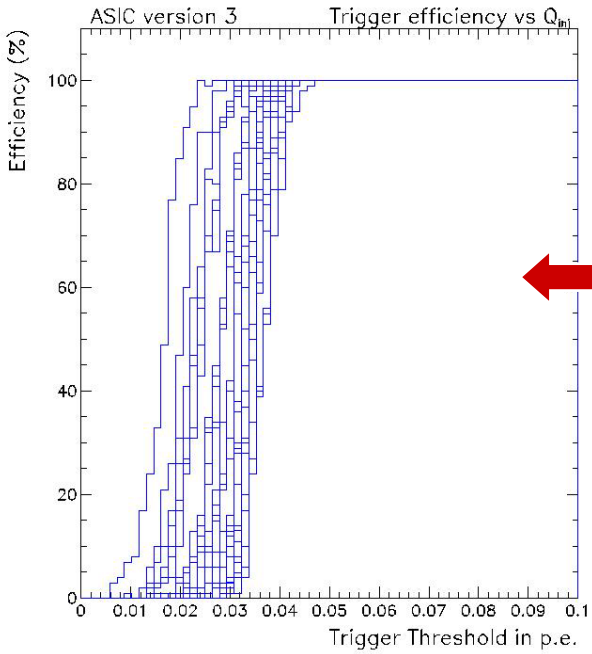
Version 2 is now validated

FE Electronics: Version 3

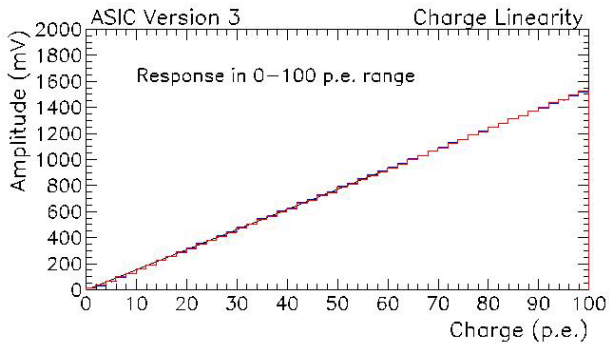
Variable Gain Preamplifier

fully functional over an extended range from 0 to 3.4

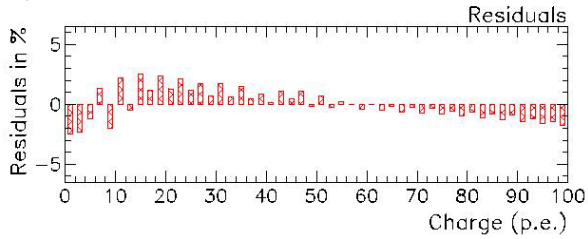




100% trigger efficiency for T>0.1 p.e.



Good Linearity over [0-100] p.e. range !



Version 3 is under validation tests

FE electronics: Vers.2 vs Vers.3

	received/ tested Version 2	received 07-APR/ being tested Version 3
Auto Trigger:		
Fast Shaper t_P	t_P=30 ns	t_P=20 ns
Fast Shaper Gain	130 mV / p.e.	500 mV/ p.e. (th)
Trigger	100% at 1/4th p.e.	100% at 1/10th p.e.
Threshold Spread	<0.1 p.e.	<0.05 p.e.
Noise RMS	1-3 mV (<< 1.p.e.)	0.5-0.8 mV
Charge meast:		
Dynamic range	[0-75] p.e.	[0-125] p.e.
Gain Correction	1 to 3 (4 bits)	0 to 4 (6 bits)
Slow Shaper t_P	t_P=105 ns	t_P=160 ns
Slow Shaper Gain	21 mV / p.e.	16 mV / p.e.
Pedestal spread	±20 mV	±10 mV
Noise RMS	0.5 mV (<<1.pe.)	1 mV (<<1.pe.)
Cross-talk	O(0.5%)	<< O(0.5%)

Version 2 has been tested & found to suit well the minimal Target Tracker requirements

Version 3 is being tested and improves Version 2:

- Extended preamplifier correction range (1+ 5 bits):
  - Switch ON/OFF individual channels
  - Correction range up to 4.0
- Injection lines for calibration
- Pedestal spread reduced (differential shapers)
- Extended dynamic range ($\Rightarrow$125 p.e.)

Conclusion & perspectives

Version-1 is validated

- Variable gain Preamplifier:
  - functional over the range [1,2.875] but no individual masking
- Auto-trigger:
  - 100% efficient @ 1/3rd p.e., threshold spread ~0.1p.e.
- Charge Measurement:
  - Good Linearity over [1,75] p.e. (ie: [0,12 pC])
  - Track & Hold fully functional, pedestal ~2 p.e.
- Tests with PMT signal:
  - Trigger & charge measurt OK, photoelectron spectrum

⇨ Note & LAL Report about Validation being released

Version-2 is under validation

- Injection lines functional (for calibration)
- Variable gain Preamplifier:
  - functional over the range [0,3.2] with individual masking
- Auto-trigger:
  - 100% efficient @ 1/10th of p.e., threshold spread improved
- Charge measurement:
  - Linearity improved over [1,125] p.e.
  - Track & Hold fully functional, pedestal improved

⇨ systematic checks being performed: Results end of April

⇨ BOTH VERSIONS SEEM TO BE PERFORMING WELL:
- Version-2 is validated
- Version-3 improves significantely Version-2 and systematics studies will be finished by the end April