

# Basic test results of PASTTREC ASIC

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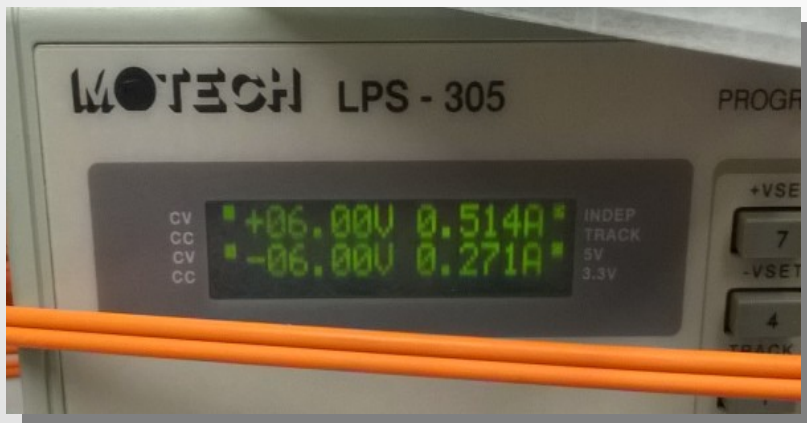
18 March 2015

# Reminder/status



## What we have:

- 6 front end electronics with ASIC bonded
- 2 PASTTREC ASIC on one PCB
- 2x8 digital and 2x8 analog channels
- Each FEB has 2 test inputs – odd and even channels
- +/- 6 V power supply (due to fast analog amplifiers)
- Ribbon cable (10 pairs) to connect to TRB3 slow control and data transmission



# Slow control

Threshold Settings

Configuration

TDC addr:  Configuration file:  PANDA\_FEE...RAKOW.txt

TRB3 qty.:

Select all  Apply to all

TDC-e000

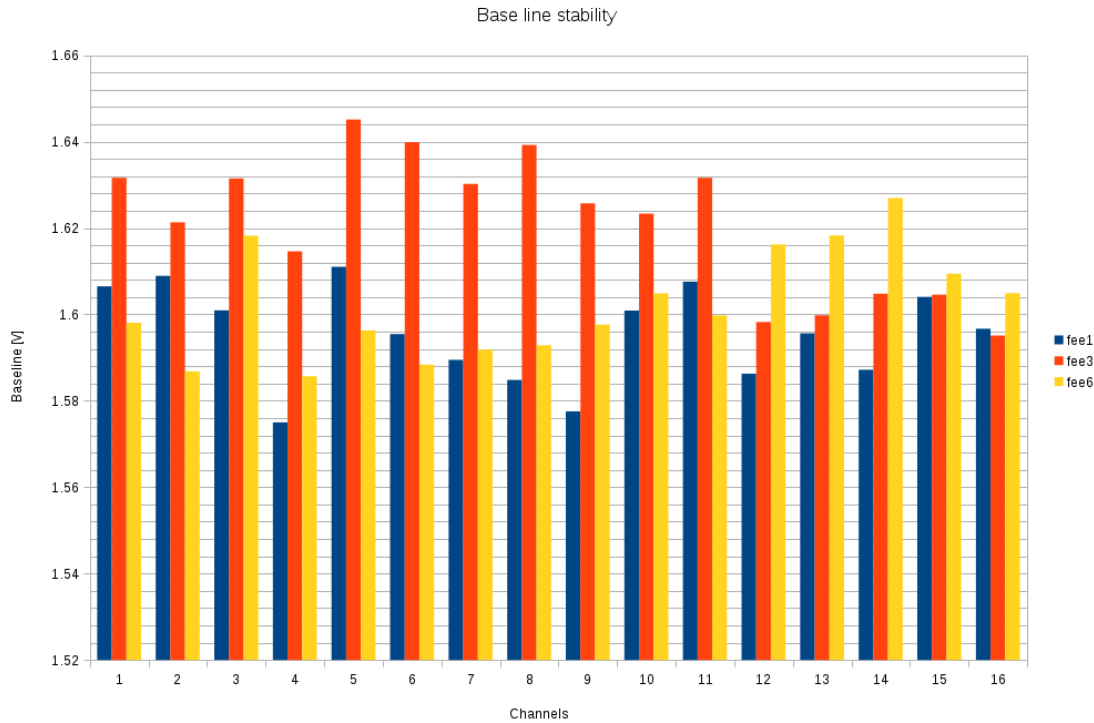
Cable conn-1  Cable conn-2  Cable conn-3  Cable conn-4

Asic-1  Asic-2

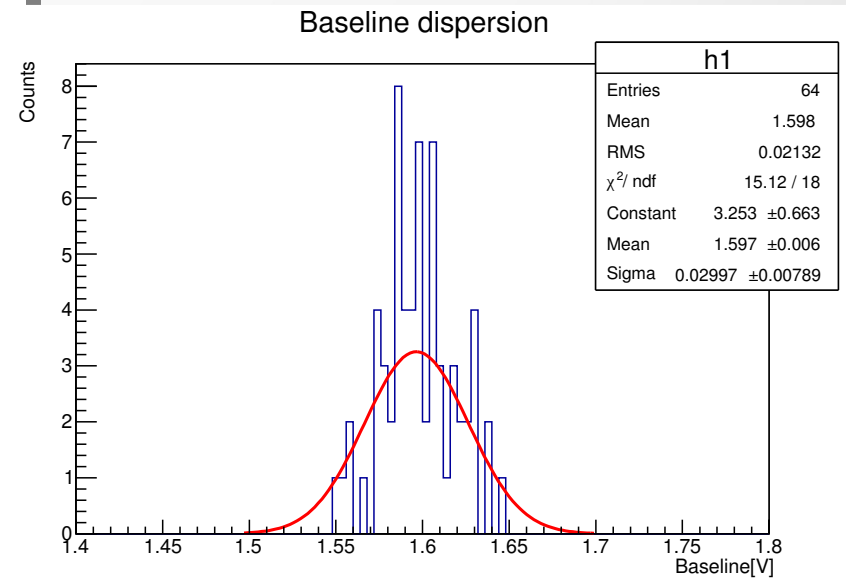
TDC-e000 Cable-1 Asic-1		TDC-e000 Cable-1 Asic-2	
Amplification [mV/IC]	4	Amplification [mV/IC]	4
Peaking time [ns]	10	Peaking time [ns]	10
TC1C <sub>2-0</sub> [pF]	13.5	TC1C <sub>2-0</sub> [pF]	13.5
TC1R <sub>2-0</sub> [kΩ]	19	TC1R <sub>2-0</sub> [kΩ]	19
TC2C <sub>2-0</sub> [pF]	1.65	TC2C <sub>2-0</sub> [pF]	1.65
TC2R <sub>2-0</sub> [kΩ]	11	TC2R <sub>2-0</sub> [kΩ]	11
Threshold (Baseline divide Baseline + 256 mV)	<input type="range" value="0"/>	Threshold (Baseline divide Baseline + 256 mV)	<input type="range" value="0"/>
Base line channel 1	<input type="range" value="0"/>	Base line channel 1	<input type="range" value="0"/>
Base line channel 2	<input type="range" value="0"/>	Base line channel 2	<input type="range" value="0"/>
Base line channel 3	<input type="range" value="0"/>	Base line channel 3	<input type="range" value="0"/>
Base line channel 4	<input type="range" value="0"/>	Base line channel 4	<input type="range" value="0"/>
Base line channel 5	<input type="range" value="0"/>	Base line channel 5	<input type="range" value="0"/>
Base line channel 6	<input type="range" value="0"/>	Base line channel 6	<input type="range" value="0"/>

Slow control integrated with TRB3 system. Setting up the ASIC is done via web interface. PC sends request to TRB3 which configure ASIC using 4 control lines.

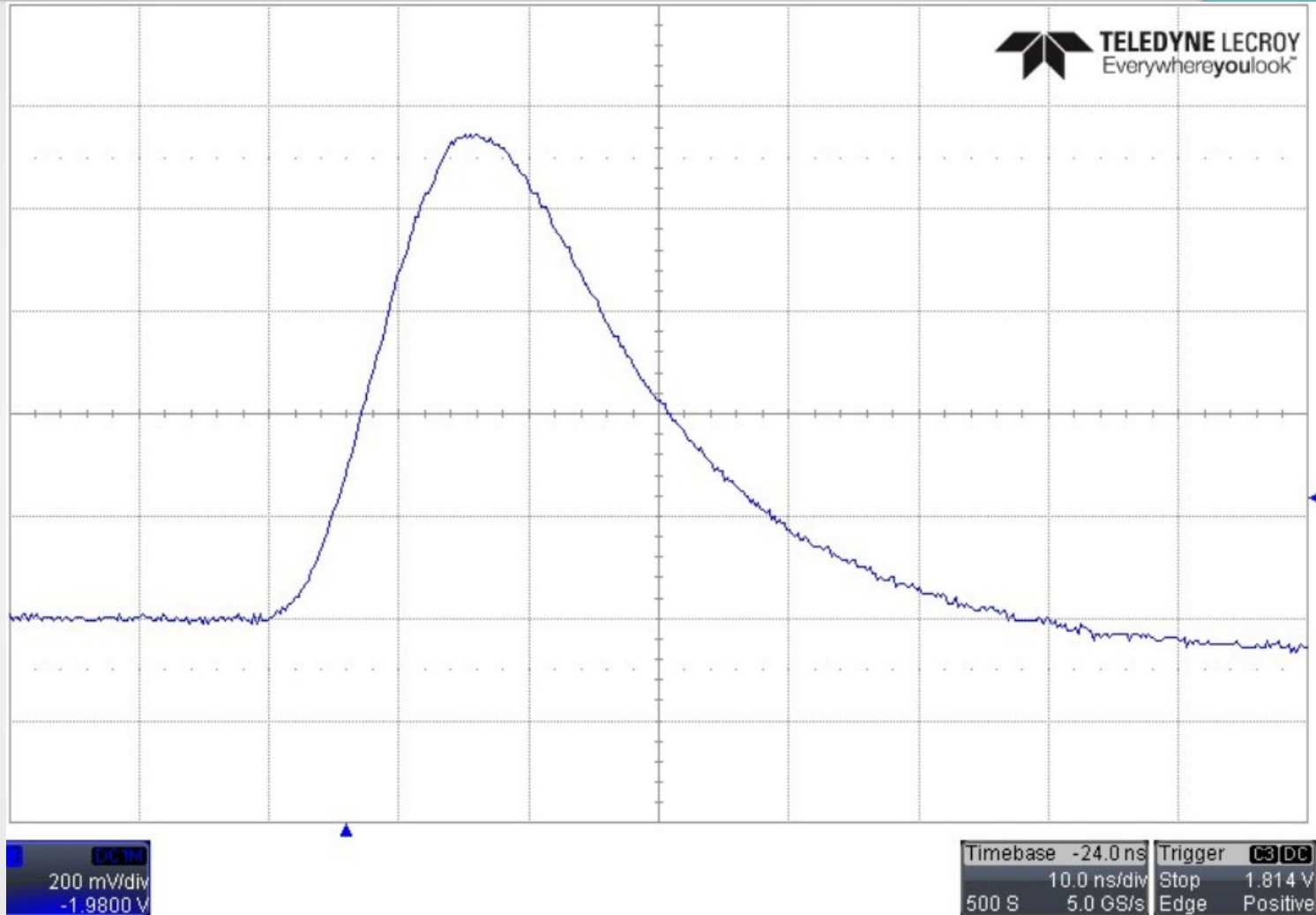
# Base line stability



FEE has amplifiers which amplify the signal and baseline by factor of 2.

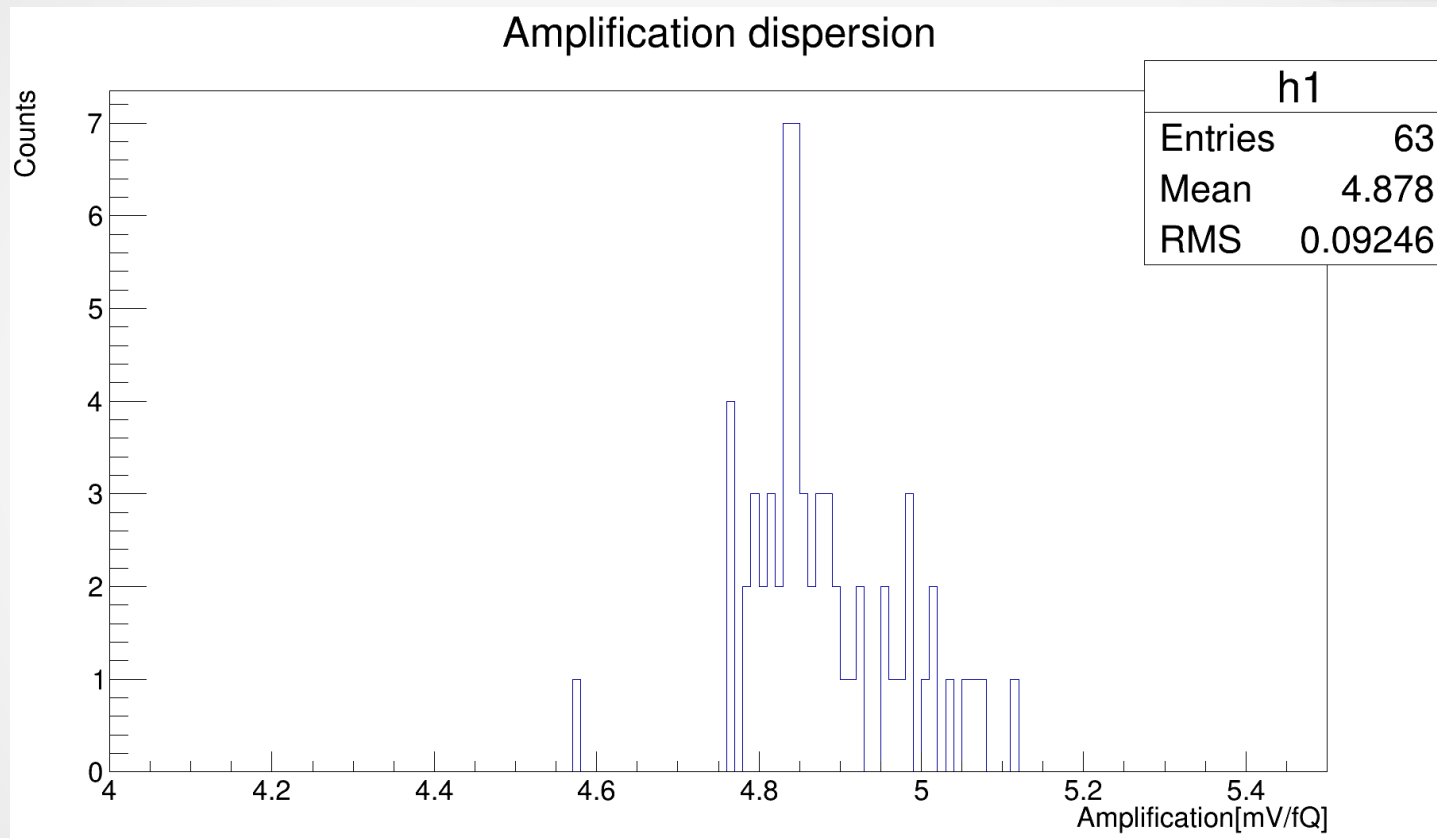


# Analog waveform



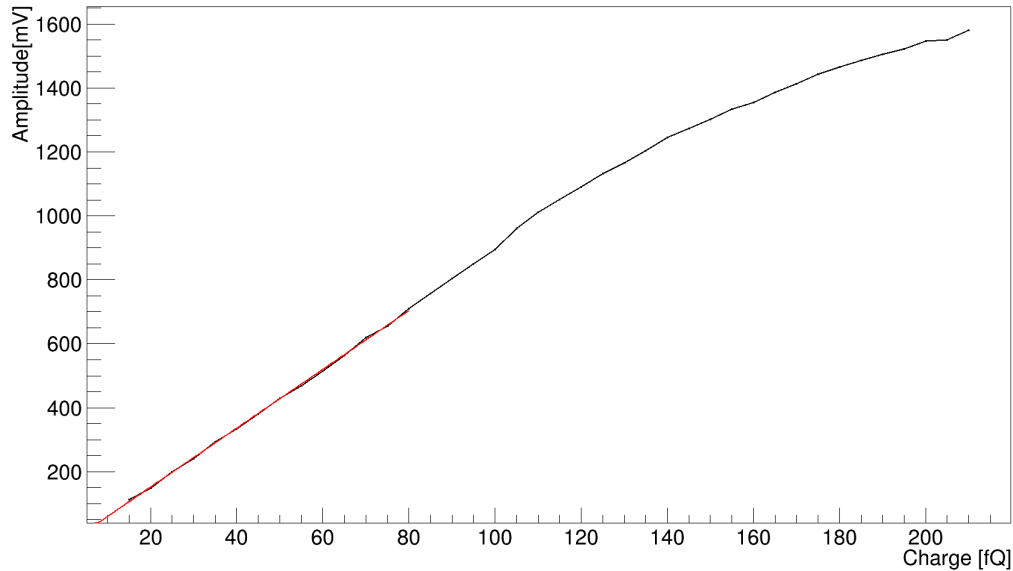
Analog output waveform with peaking time around 14 ns. No detector connected.

# Amplification dispersion



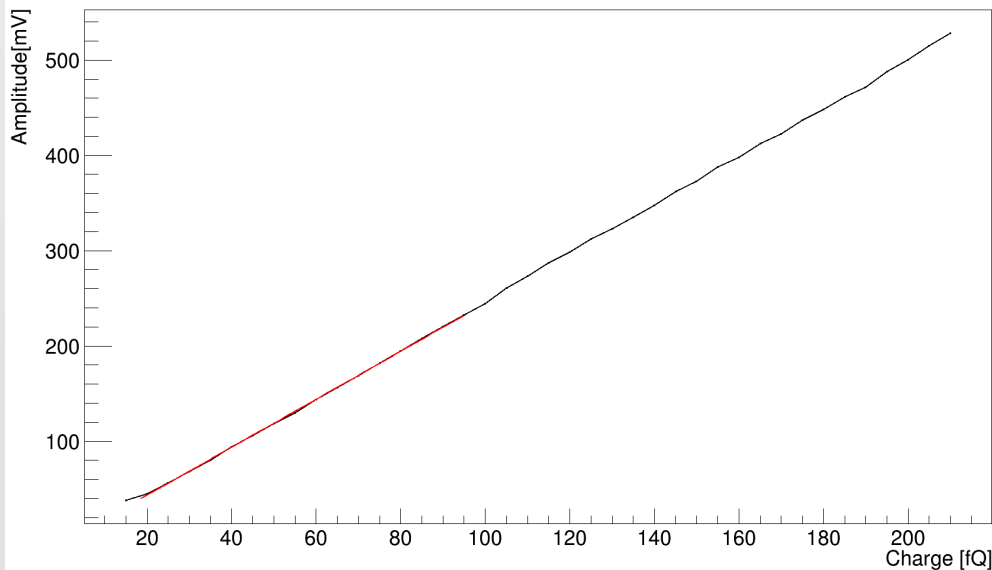
Low (2%) ASICs amplification dispersion. Histogram done for 100fQ input charge without external amplification (factor 2).

# Charge and analog output correlation



Correlations done without external amplification.

Maximum gain setting  
 $K = 4.5 \text{ mV/fQ}$



Low gain setting  
 $K = 1.25 \text{ mV/fQ}$

tests

# Outlook

- Perform more test with generator
  - Drift time vs channel correlation and baseline tuning
  - ToT vs channel
  - ToT vs charge
- Readout preparation (TRB3, new TDC version)
- Tests with detector and preparation for beam time in May



Thank you for your attention!

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Acknowledgments:

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