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Target Diagnostic Operations Summary August 29-30, 2009

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Target Diagnostic Operations Summary

August 29-30, 2009

Experiment: Hohlraum_Act_D_S14f

This campaign will validate the capability of fielding cryogenic hohlraums by demonstrating that the radiation temperature is not affected by contamination and ice buildup.

Warm Hohlraum Energetics: 60GHz SSD, 1.5 Å wavelength, 3ω energies adjusted for 8kJ at LM8, 6 beams 3ω 50% down

Hohlraum filled with 296 torr of C₃H₁₂. Capsule filled with 2485 torr of C₃H₈.

Shot ID: N090829-001-999

Issues / Results Summary

Good data acquired on all participating diagnostics.

The tees in the signal lines to Lower Dante Scopes 15-18 were removed for this shot, so the fiducial signal was not sent to these scopes.

FABS

During an Integrated Dry Run, the FABS Q31B SBS Streak Camera indicated the GEP Streak Trigger status changed to IDLE at t-120 (2009-08-30 00:09:57), when it still should have indicated ARMED; however, the appearance of the comb signal in the Shot image that is acquired in this condition indicates that the sweep did occur. This anomaly has been seen on more than one occasion. LoCoS Problem Log #295423

GXD

GXD Pulser produces an alarm at a varying frequency of every few seconds to every few minutes saying the WaterInTemp_C is out of range. If you observe the temperature on the controller GUI, you see that the temperature reading is very noisy. The average value of the reading is in range, but it fluctuates wildly such that it sometimes reads below the low end of the required range. The addition of some Range Hysteresis in the range checking of WaterInTemp_C would remedy this problem. LoCoS Problem Log #295424.

When the system shot fired, the pressure in the chamber went over 5E-5 torr, so the GXD Pulser disabled high voltage and reported Failed. All diagnostics moved on to the DataCaptured state except the GXD Pulser. Because of the Failed state of the GXD Pulser, the GoTo ARCHIVED_AND_READY would not run, so NONE of the diagnostics were archived. The TDO worked around this by opening the TDS Manager's Clock Control window and clicking the Archive button. That caused all the diagnostics to archive. LoCoS Problem Log #295443.

Known Issues, still with us:**FABS Streak Cameras and GXD**

Randomly at any time, a GXD or GSCP Camera “CCD Initialized” status will go red. Have to command Re-Init CCD, then all is well again. Existing Problem Log 294562.

Recorded failure frequency information today (table added to problem log):

CCD Initialized Failures during August 29-30 Shot Operations	
Time	Device
16:40	FABS 31 SRS GSCP
16:43	FABS 36 SRS GSCP
17:32	FABS 36 SRS GSCP
18:02	FABS 31 SBS GSCP
18:53	FABS 36 SBS GSCP
19:20	FABS 31 SRS GSCP
19:21	FABS 31 SBS GSCP
20:29	FABS 36 SRS GSCP
21:23	FABS 36 SBS GSCP
22:07	FABS 36 SRS GSCP
22:41	FABS 31 SBS GSCP
00:13	GXD
01:08	FABS 36 SBS GSCP
01:34	FABS 36 SBS GSCP
01:46	FABS 36 SRS GSCP
01:56	GXD
01:57	FABS 36 SRS GSCP
02:06	GXD
02:06	FABS 31 SRS GSCP
02:17	GXD
02:53	FABS 36 SRS GSCP

FFLEX

Voltages for PM Tubes 9 and 10 are not listed in the M-SSAR.

NBI

NBI Q31B SRS camera cooler does not work – creates alarms and requires that this diagnostic be put into Maintenance Mode to get through Populate Plan. Existing Problem Log #294565.

NBI Q31B SRS camera cooler problem exposes an error in the TDS shot software: if a diagnostic has an error so that the rolled-up Ready status is “Usable” instead of “Ready”, then the shot software does not handle the situation correctly. The shot software does not wait for all the participating diagnostics to get to the Set state before figuring the Min Tick, so Min Tick is set incorrectly. Until the software is fixed, the workaround is to set the Shot Supervisor to Manual Mode so the Min Tick step may be initiated after all the diagnostics are in the Set state. New Problem Log #295388.

Shot software tries to send GoTo setpoint commands to non-existent NBI SPECTRALON-CCD cameras. Result is all Macrosteps that setup the video cameras fail and Lead Operator must issue Success By Override to continue. Existing Problem Log #294566.

Operators

TDOs

Jeff Baron

Brandi Lechleiter

TDC

Karl Pletcher

Participation

Dante-Lower (143-274)	Primary
Channels 1 – 18	Primary
Dante-Upper (064-350)	Dropped
EEMP	Tertiary, run manually
FABS Q31B	Secondary
Camera B315	Secondary
Camera B316	Secondary
Camera B317	Secondary
Camera B318	Secondary
SRS Fast Diode Scope	Secondary
SBS Fast Diode Scope	Secondary
Slow Diode Scope	Secondary
Streak Camera SRS	Secondary
Streak Camera SBS	Secondary
Cal Spect Camera	Secondary
Gate Monitor Scope	Secondary
FABS Q36B	Secondary
Camera B365	Secondary
Camera B366	Secondary
Camera B367	Secondary
Camera B368	Secondary
SRS Fast Diode Scope	Secondary
SBS Fast Diode Scope	Secondary
Slow Diode Scope	Secondary
Streak Camera SRS	Secondary
Streak Camera SBS	Secondary
Cal Spect Camera	Secondary
Gate Monitor Scope	Tertiary

FFLEX (090,110)	Secondary
PMTs 1-10	Secondary
GXD	Secondary
NBI (Q31B)	Secondary
Scope	Secondary
GSCP	Not Used
SRS Camera	Secondary
SRS Diode	Secondary
SBS Camera	Secondary
SBS Diode	Secondary
NBI (Q36B)	Secondary
Scope	Secondary
GSCP	Not Used
SRS Camera	Secondary
SRS Diode	Secondary
SBS Camera	Secondary
SBS Diode	Secondary
NToF 4m (064,275)	Tertiary, run manually
SXI-Lower (161,326)	Secondary
SXI-Upper (018,123)	Dropped (Camera replaced with an 'image plate', which is completely passive, so no software control required or desired)

Setup

Timing

Client Delays

Dante-1 (Lower, 143,274)

Trigger 1	0.0 ns
Trigger 2	9.0 ns
Trigger 3	4.5 ns

EEMP

Scopes	345, 345, 345 ns
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FABS Q31B

CAL-SPECT-CCD	-890 ns
SBS Streak CCD	500,000,000 ns
SBS Streak Comb	-1234 ns
SBS Streak Sweep	-284.637 ns
SCOPE	0 ns
SPECTRALON-CCD	-750,000 ns
SRS Streak CCD	500,000,000 ns

SRS Streak Comb	-1385 ns
SRS Streak Sweep	-424.773 ns

FABS Q36B

CAL-SPECT-CCD	-700.0 ns
SBS Streak CCD	500,000,000 ns
SBS Streak Comb	-1100 ns
SBS Streak Sweep	-194 ns
SCOPE	0 ns
SPECTRALON-CCD	-750,000 ns
SRS Streak Comb	-1150 ns
SRS Streak Sweep	-197 ns
SRS Streak CCD	500,000,000 ns

FFLEX

Trigger	412 ns
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GXD (90,315)

DIM 90-315 Trigger 2, GXD CCD	500,000,000 ns
DIM 90-315 Trigger 3, GXD Pulse	-439.833 ns
DIM 90-315 Trigger 4, GXD Phosphor	-15000 ns
DIM 90-315 XTS Trigger 1, Scope	0

NBI (Q31B)

Cal Laser DIAG	-1093 ns
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NBI (Q36B)

Cal Laser DIAG	-1093 ns
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NToF 4m (064,275)

Scope Trigger	0 ns
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SXI-Lower (161,326)

CCD –Trigger (CCD)	500,000,000 ns
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Configurations

Dante-Lower (143,274)

The tee in the signal line to Dante Lower Scopes 15-18 was removed for this shot, so there was no fiducial signal sent to these scopes.

Attenuator configuration was not finalized in time to put into M-SSAR. Verified configuration per setup sheet from Dante RS.

Attenuator Configuration	
Channel	Total Attenuation (dB)
1	10
2	26
3	28
4	16
5	20
6	16
7	18
8	24
9	20
10	26
11	24
12	10
13	2
14	0
15	0
16	0
17	0
18	0

EEMP

	Scope 1	Scope 2	Scope 3
Channel 1 V/div	0.5	0.5	0.5
Channel 2 V/div	1.0	0.5	0.5
Channel 3 V/div	0.5	0.5	0.5
Channel 4 V/div	1.0	0.1	0.5
Sweep Speed, ns/div	200	200	200

FABS Q31B**SRS Fast Diode Scope**

Channel 1 Vertical Range	2 V
Channel 2 Vertical Range	2 V
Channel 3 Vertical Range	2 V
Channel 4 Vertical Range	2 V

SBS Fast Diode Scope

Channel 1 Vertical Range	2 V
Channel 2 Vertical Range	2 V
Channel 3 Vertical Range	2 V
Channel 4 Vertical Range	2 V

Slow Diode Scope

Channel 1 Vertical Range	2 V
Channel 2 Vertical Range	2 V
Channel 3 Vertical Range	2 V
Channel 4 Vertical Range	2 V

SRS Streak Camera

Sweep Speed	40ns
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SBS Streak Camera

Sweep Speed	40ns
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FABS Q36B**SRS Fast Diode Scope**

Channel 1 Vertical Range	2 V
Channel 2 Vertical Range	2 V
Channel 3 Vertical Range	2 V
Channel 4 Vertical Range	2 V

SBS Fast Diode Scope

Channel 1 Vertical Range	2 V
Channel 2 Vertical Range	2 V

Channel 3 Vertical Range 2 V
 Channel 4 Vertical Range 2 V

Slow Diode Scope

Channel 1 Vertical Range 2 V
 Channel 2 Vertical Range 2 V
 Channel 3 Vertical Range 2 V
 Channel 4 Vertical Range 2 V

SRS Streak Camera

Sweep Speed 40ns

SBS Streak Camera

Sweep Speed 40ns

FLEX Settings

Scope	Horizontal Scale [μs/div]	PM Tube #	HVPS Voltage [V]	Capacitance [pF]	Channel #	Vertical Full Range [V]
1	25	1	-1050	22,000	1	0.50
					2	10
		2	-830	22,000	3	0.50
					4	10
2	25	3	-975	22,000	1	0.50
					2	10
		4	-920	22,000	3	0.50
					4	10
3	25	5	-1250	22,000	1	0.50
					2	10
		6	-1020	22,000	3	0.50
					4	10
4	25	7	-1220	22,000	1	0.50
					2	10
		8	-1400	22,000	3	0.50
					4	10
5	25	9	1,100†	4,700	1	0.50
					2	10
		10	1,300†	4,700	3	0.50
					4	10
6	0.5	9	1,100†		1	0.50
					2	10
		10	1,300†		3	0.50
					4	10

† Not listed in M-SSAR.

GXD (90,315)

PCD Voltage	100 V
Strip 1 Backbias	150 V
Strip 2 Backbias	150 V
Strip 3 Backbias	150 V
Strip 4 Backbias	150 V
Strip #1 timing delay	200 ps
Strip #2 timing delay	400 ps
Strip #3 timing delay	600 ps

NBI Q31B**Scope**

Channel 1 Vertical Scale	0.1 V/division
Channel 2 Vertical Scale	1.0 V/division
Channel 3 Vertical Scale	1.0 V/division
Channel 4 Vertical Scale	1.0 V/division

NBI Q36B**Scope**

Channel 1 Vertical Scale	0.1 V/division
Channel 2 Vertical Scale	1.0 V/division
Channel 3 Vertical Scale	1.0 V/division
Channel 4 Vertical Scale	1.0 V/division

NToF 4m (064,275)**Scope**

Channel 1 Vertical Scale	0.05 V/division
Channel 2 Vertical Scale	0.01 V/division
Channel 3 Vertical Scale	0.01 V/division
Channel 4 Vertical Scale	0.1 V/division

Startup Issues

Had to start GXD three times to get it all running correctly.

FABS 31 CAL-SPECT-CCD cooler was not functioning initially. Restarting the camera controller remedied the issue.

Independent Dry Runs

All OK.

Integrated Dry Runs

Ran several Integrated Dry Runs until got one to go through without errors. In the end, all diagnostics ran correctly.

Issues encountered:

FABS Q31B

During one of the Integrated Dry Runs, the SBS Streak Camera indicated the GEP Streak Trigger status changed to IDLE way before t-zero, when it still should have indicated ARMED; however, the appearance of the comb signal in the Shot image that is acquired in this condition indicates that the sweep did occur. This anomaly has been seen on more than one occasion. LoCoS Problem Log #295423

FFLEX (090,110)

In a couple of the Integrated Dry Runs, when going to Set state, several HVPSs generated an alarm saying the voltage setting is out of range, but in every case the controller GUI indicates the voltage has been set as desired.

GXD (090,315)

At t-120 camera generated alarm: Failed to complete command for tick >= -120; Exception:gov.llnl.nif.tas.framework.datasets.DataAccessException: Exceptions occurred while processing commands: gov.llnl.nif.tas.framework.datasets.DataAccessException: Camera command acquireDarkImage reports error: testCommand succeeded, returning 18 after 0 milliseconds Error == 18 (12)
PRESHOT_02 image not acquired.
On TDS Manager, Data status was set to "Partial"

Ran a few more dry runs with same results.

Cycled power on the camera and restarted its controller.

Ran another dry run and this time did not get the above error and both PRESHOT images were acquired. Unfortunately the CCD Initialized went red just before t-zero, so SHOT image was acquired with camera in a questionable status.

Ran another dry run. This time GXD and all other diagnostics ran without error.

Rod Shot N090829-001-001

Shot fired at 2009 August 30 02:40:29

All OK. One alarm – see below:

FABS Q31B

At t-102 the SRS Streak camera generated an alert saying the GEP trigger state was TRIGGERED when it should be ARMED; however, the controller GUI indicated the GEP trigger state was still ARMED.

System Shot N090829-001-999

Shot fired at 2009 August 30 03:14:10

Good data acquired on all diagnostics.

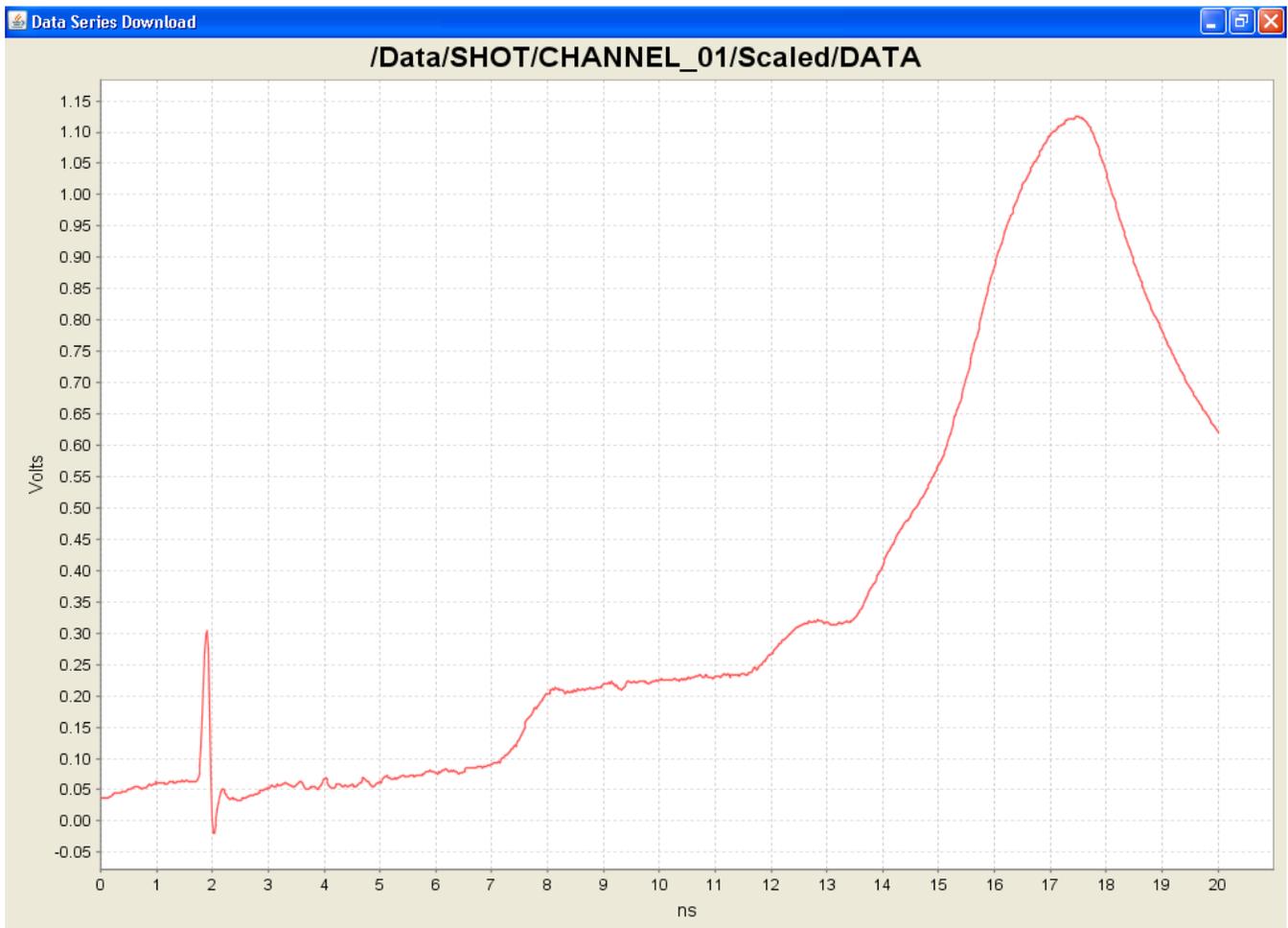
All diagnostics got to DataCaptured state except the GXD Pulser. Then GoTo ARCHIVED_AND_READY would not run, so nothing was archived. TDO opened the TDS Manager's Clock Control window and clicked the Archive button. That caused all the diagnostics to archive.

Dante-1 (143,274)

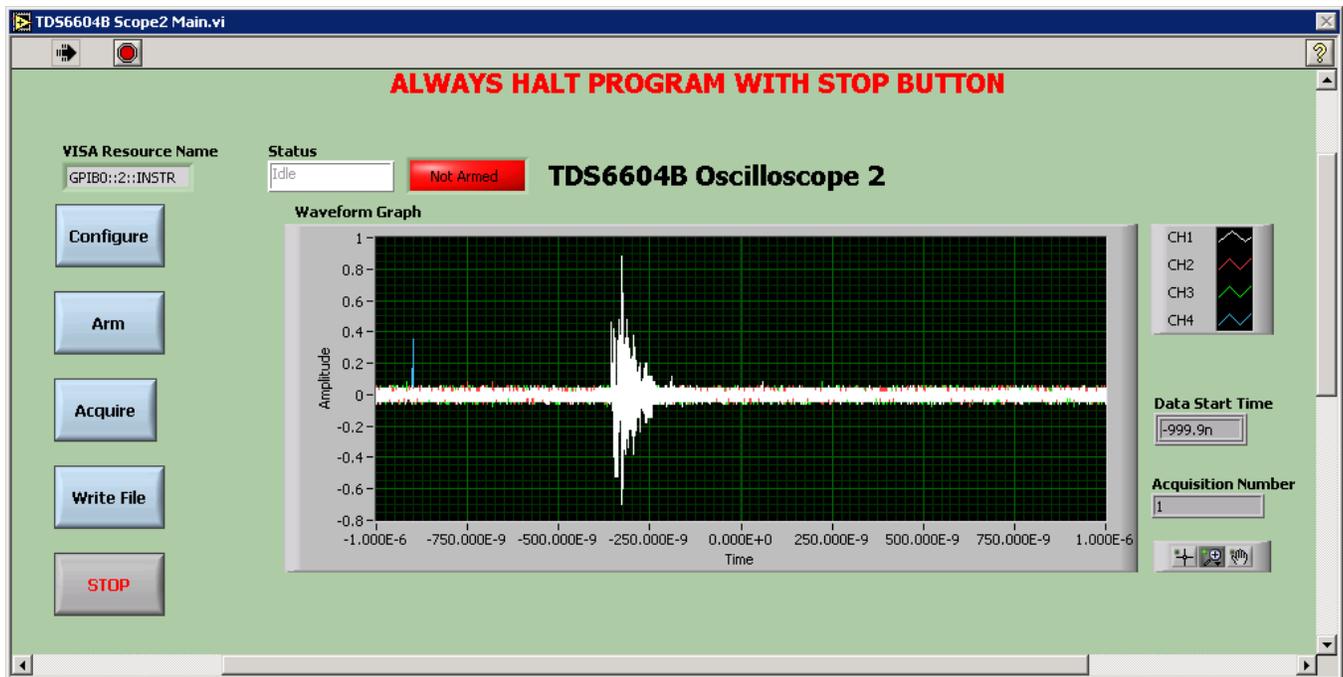
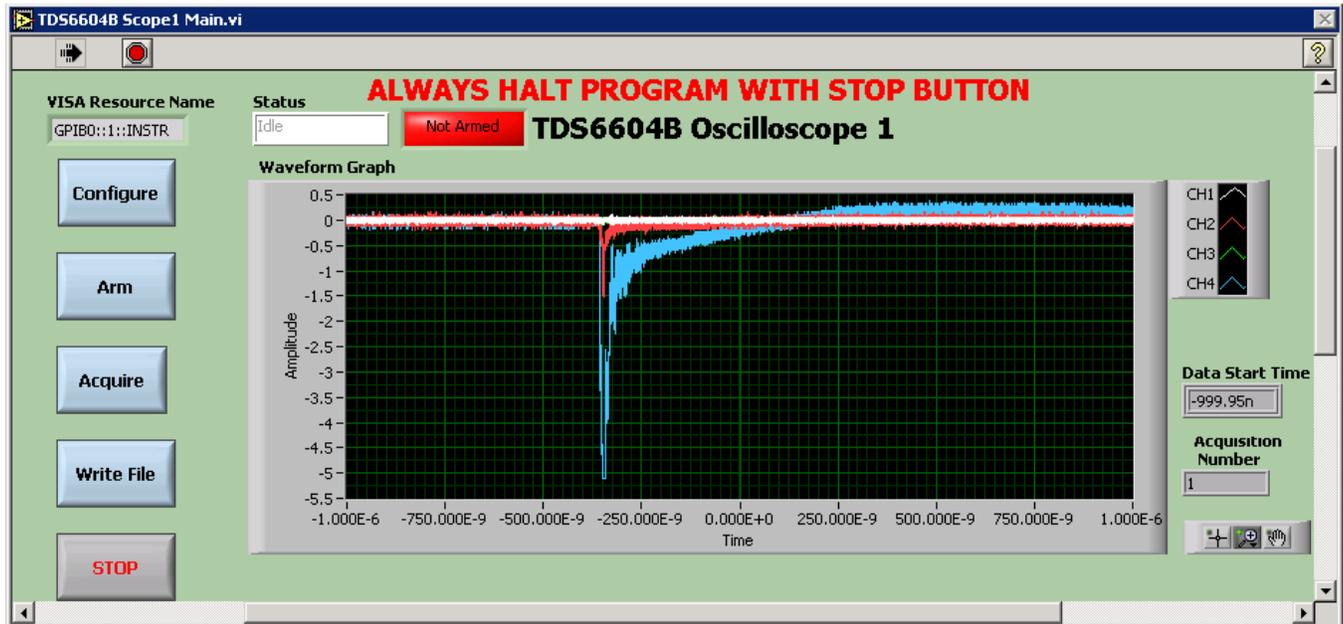
After t-zero, HVPS generated this alert:

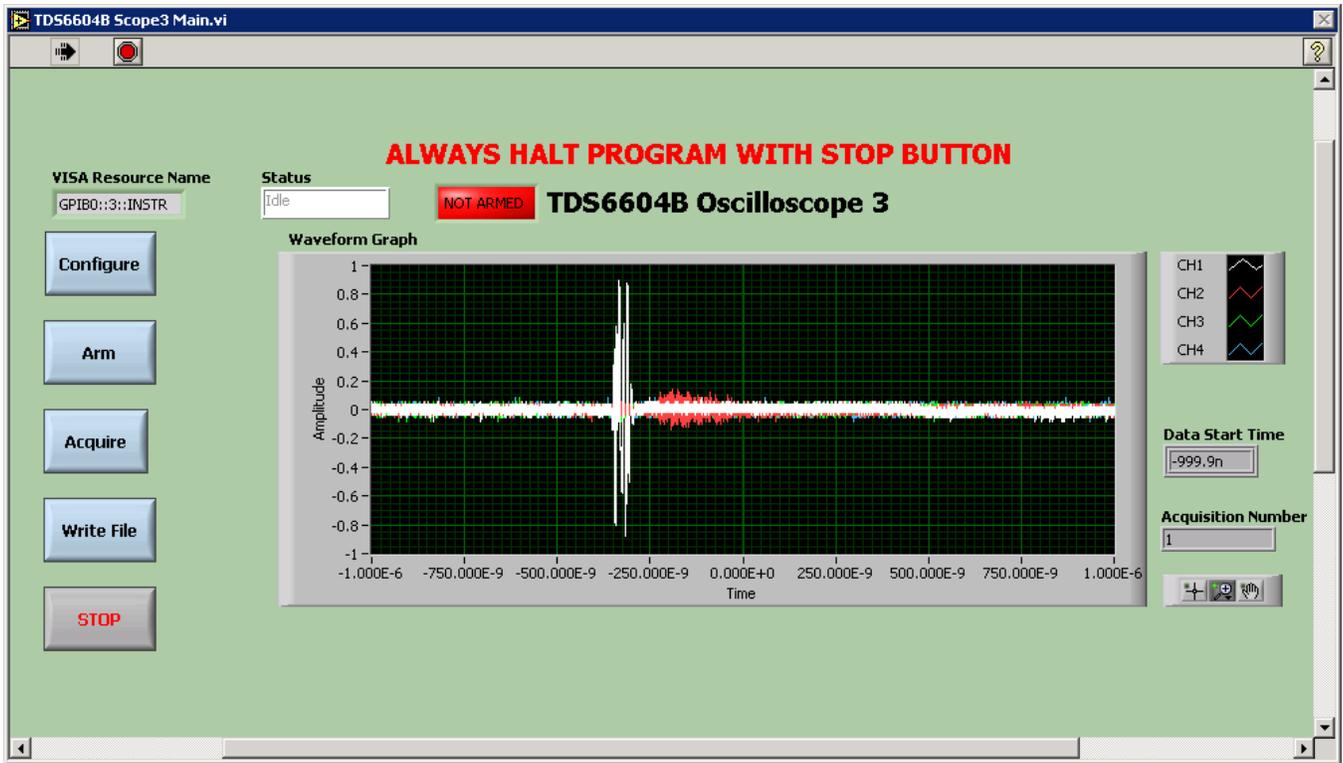
OUT OF RANGE - /PS350@GPIB0::1::INSTR/SetPoints/VoltageSetting, current value = 0.0. Target:4900.0 RangeType:TargetExactVoltage Setting Range condition

Nice quality pulses recorded. Example: Channel 3 reflects the input laser pulse shape:



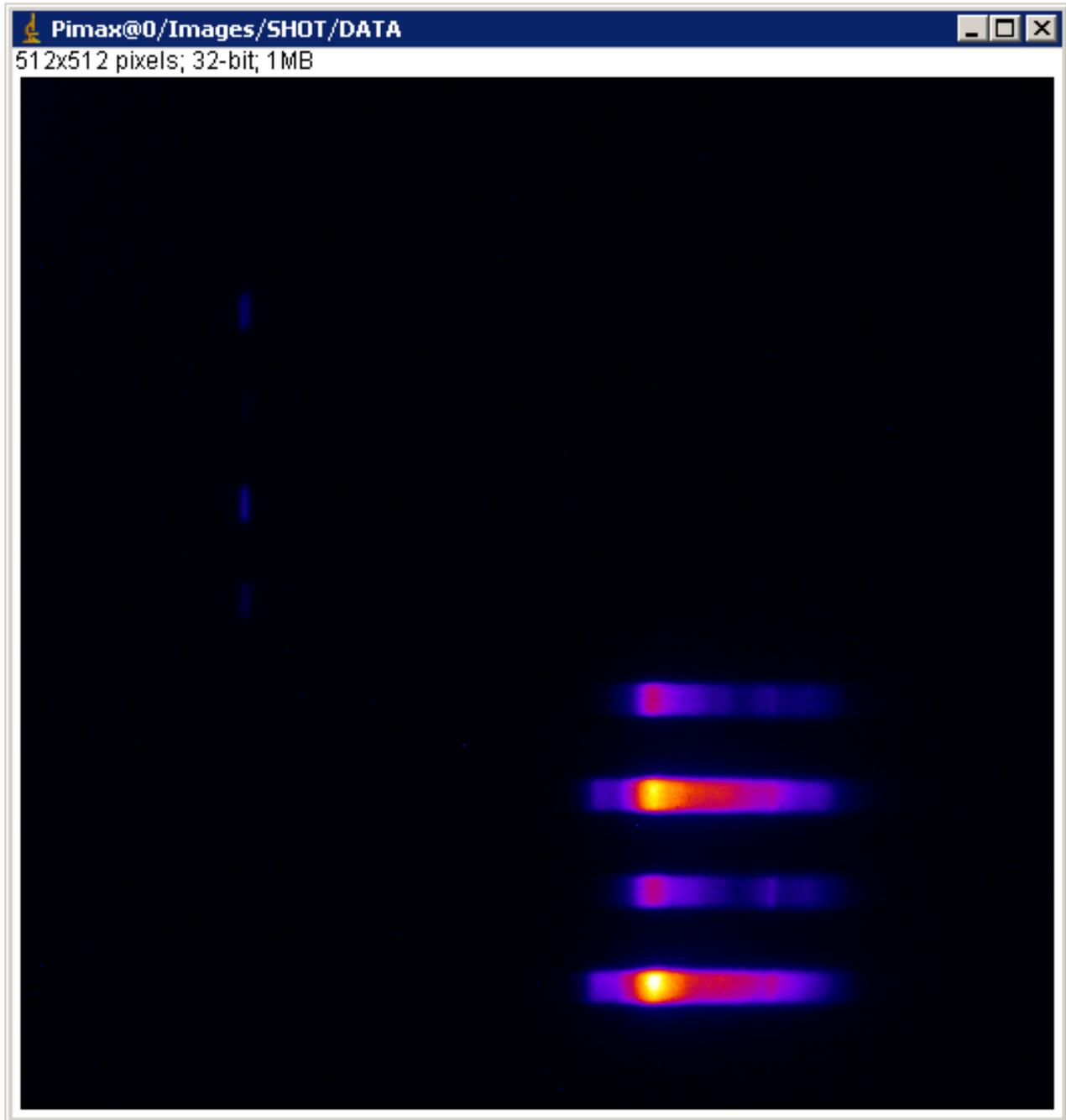
EEMP





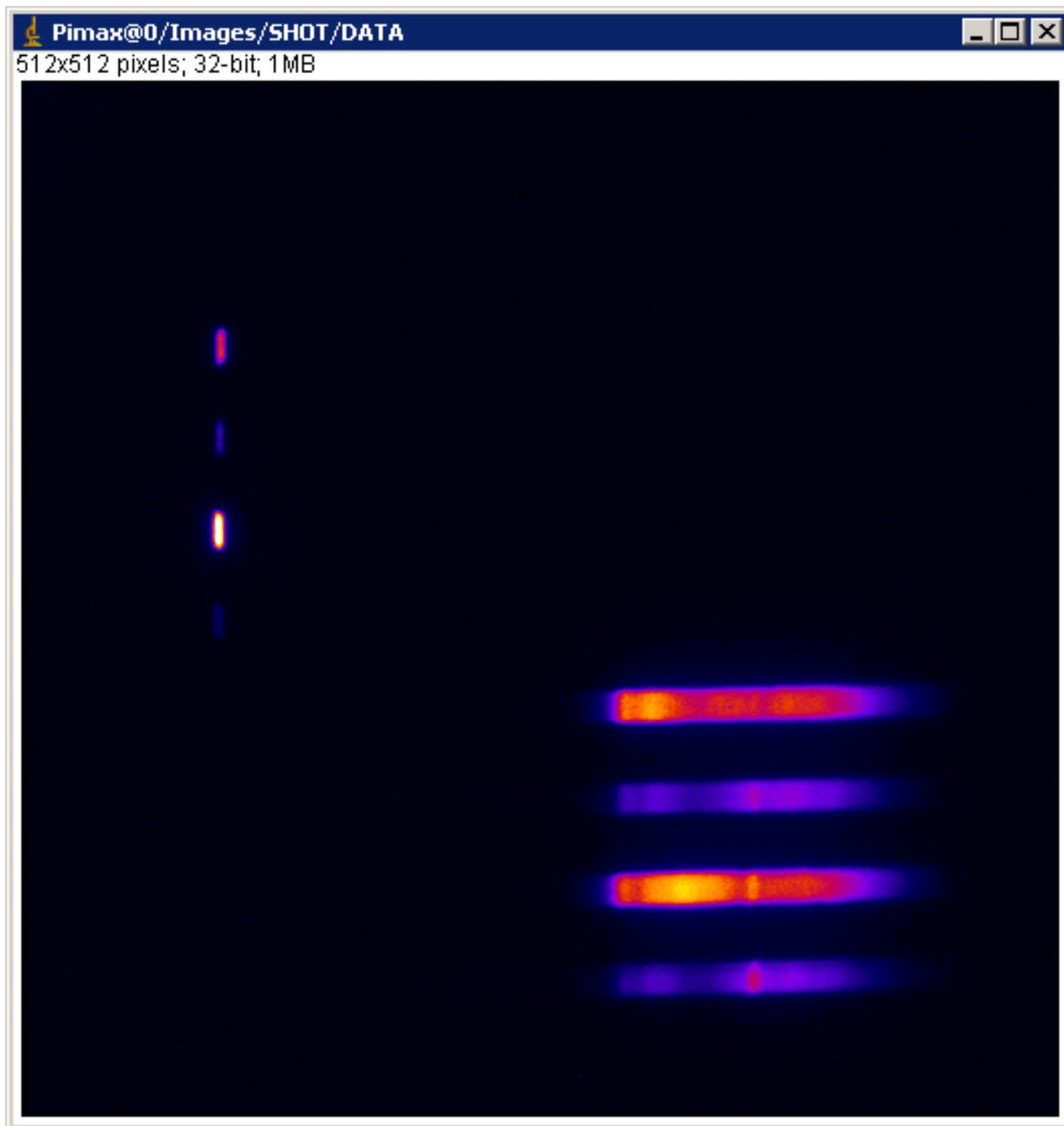
FABS Q31B

Good data acquired. Example: Cal Spect CCD:



FABS Q36B

Good data acquired. Example: Cal Spect CCD:

**FFLEX (090,110)**

Good signals recorded – none saturated

GXD (090,315)

After t-zero, Pulser generated these alerts:

OUT OF RANGE - /GxdIOCard@0/Analog/Vacuum_Torr, current value = 3.1445608273834326E-4. Min:9.0E-7 Max:5.0E-5 RangeType:AbsoluteMinMax Range Error/Recovery on Vacuum_Torr

OUT OF RANGE - /GxdPulser@COM2/Control/Stat_PhosEnabled, current value = false. Target:true RangeType:TargetExact Range Error/Recovery on Stat_PhosEnabled

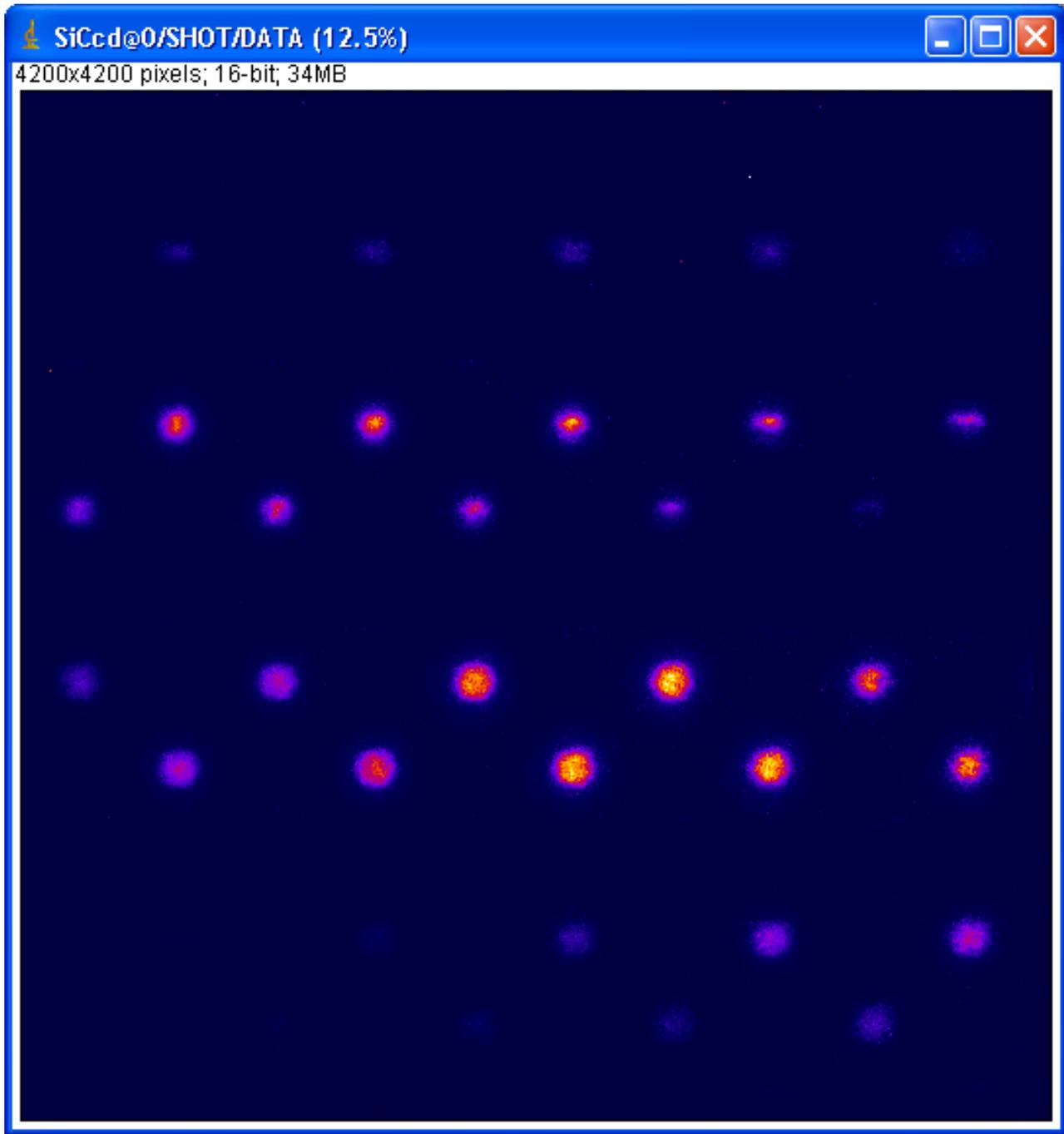
OUT OF RANGE - /GxdPulser@COM2/Control/Stat_HWEnabled, current value = false. Target:true RangeType:TargetExact Range Error/Recovery on Stat_HWEnabled

OUT OF RANGE - /GxdPulser@COM2/PCD/VMeasPCD_V, current value = -1. Target:100 Min:12 Max:12 RangeType:TargetMinMax Range Error/Recovery on VMeasPCD_V

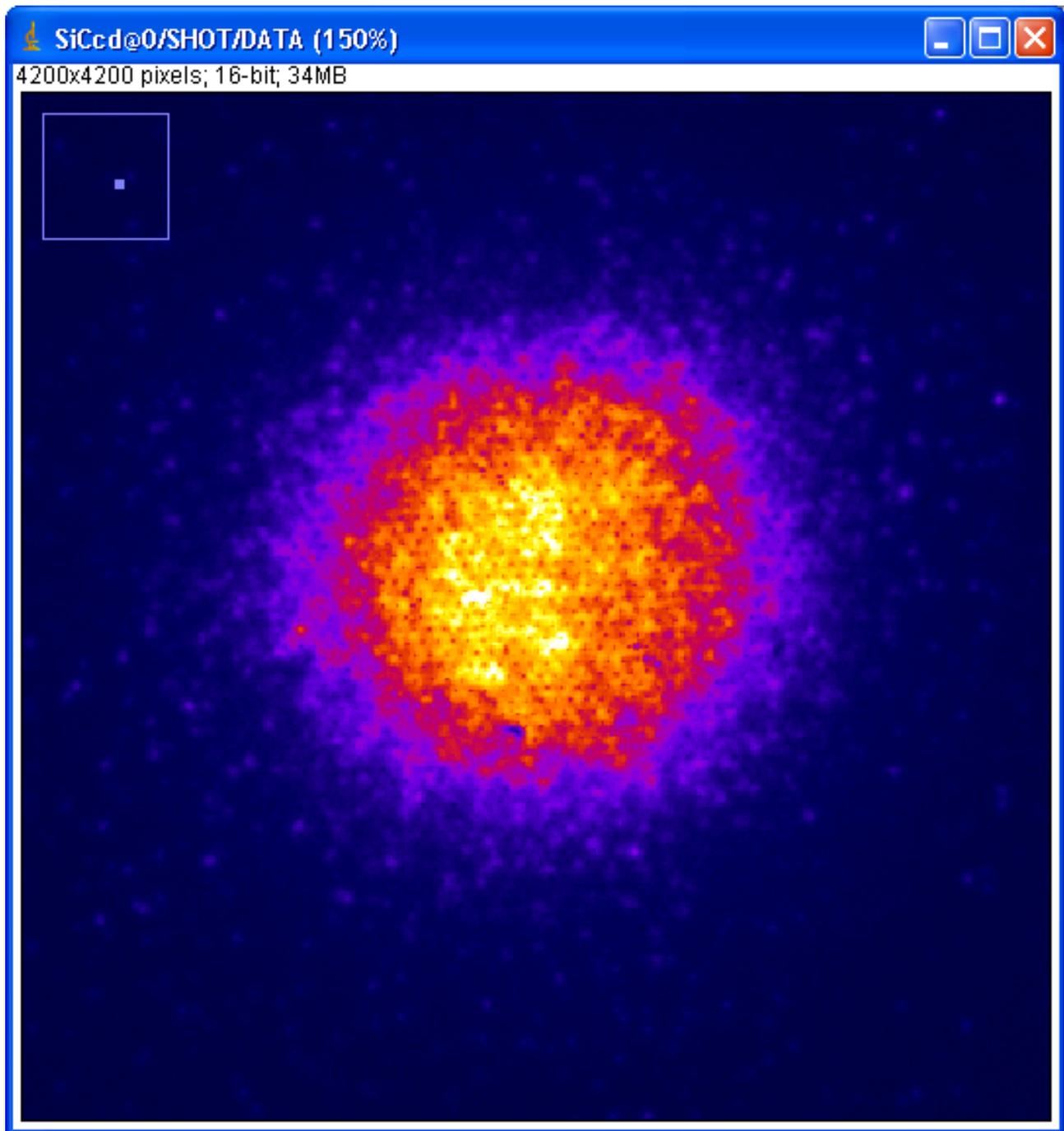
OUT OF RANGE - /GxdPulser@COM2/Control/Stat_BiasEnabled, current value = false. Target:true RangeType:TargetExact Range Error/Recovery on Stat_BiasEnabled

OUT OF RANGE - /GxdPulser@COM2/Phosphor/VPSMeasPhos_V, current value = 58. Target:5000 Min:0 Max:25 RangeType:TargetPercent Range Error/Recovery on VPSMeasPhos_V

Full image:



Zoomed in on one of the brightest spots:



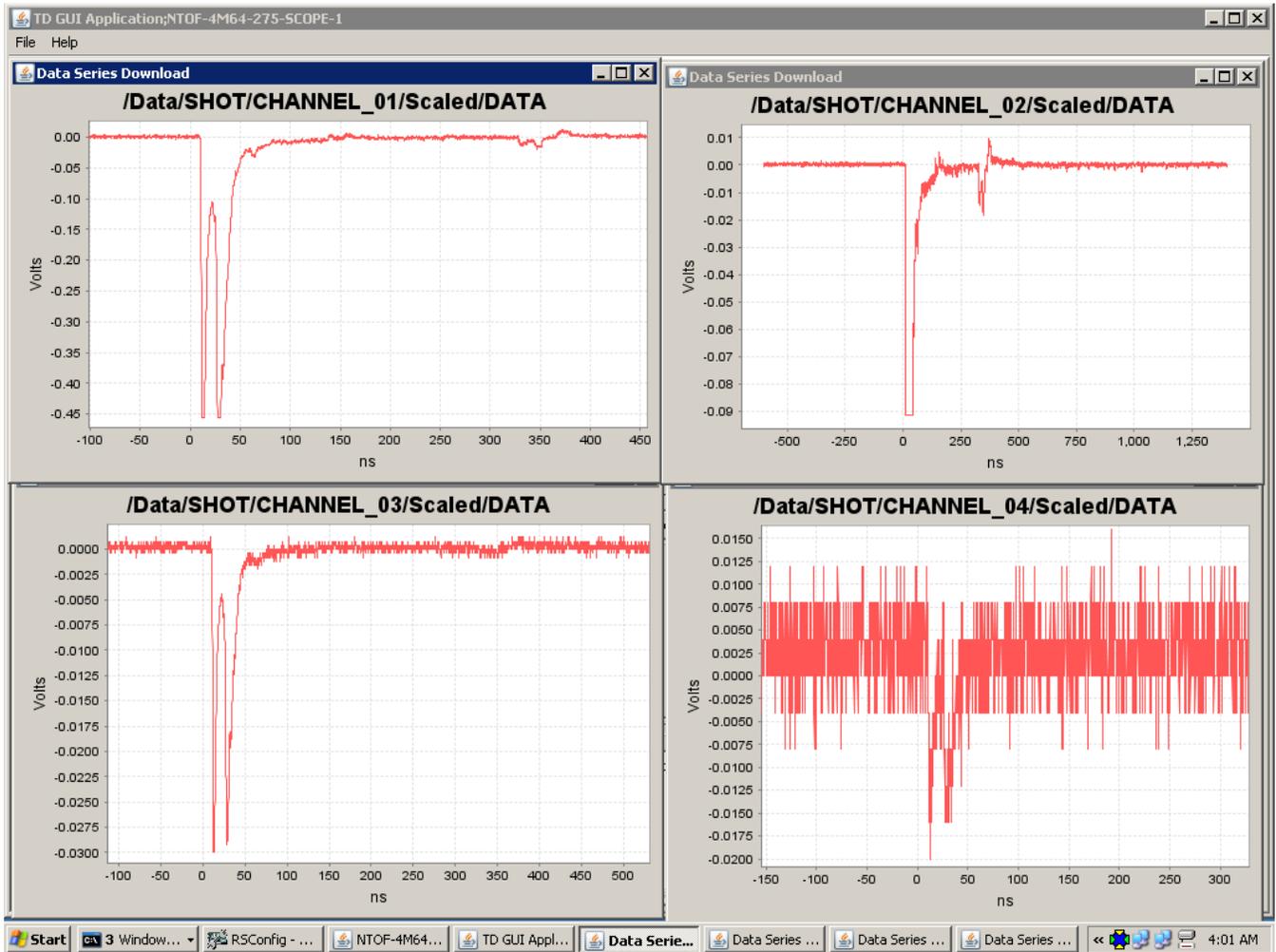
NBI Q31B

Good data acquired.

NBI Q36B

Good data acquired.

NToF 4m (064,275)



SXI Lower (161,326)

Zoomed in on the best of the four images:

