



CAPTURE CAVITY II UPDATE

Ray Filler
For Elvin Harms
For Andy Hocker
taking over
from Tim Koeth
July 26, 2006



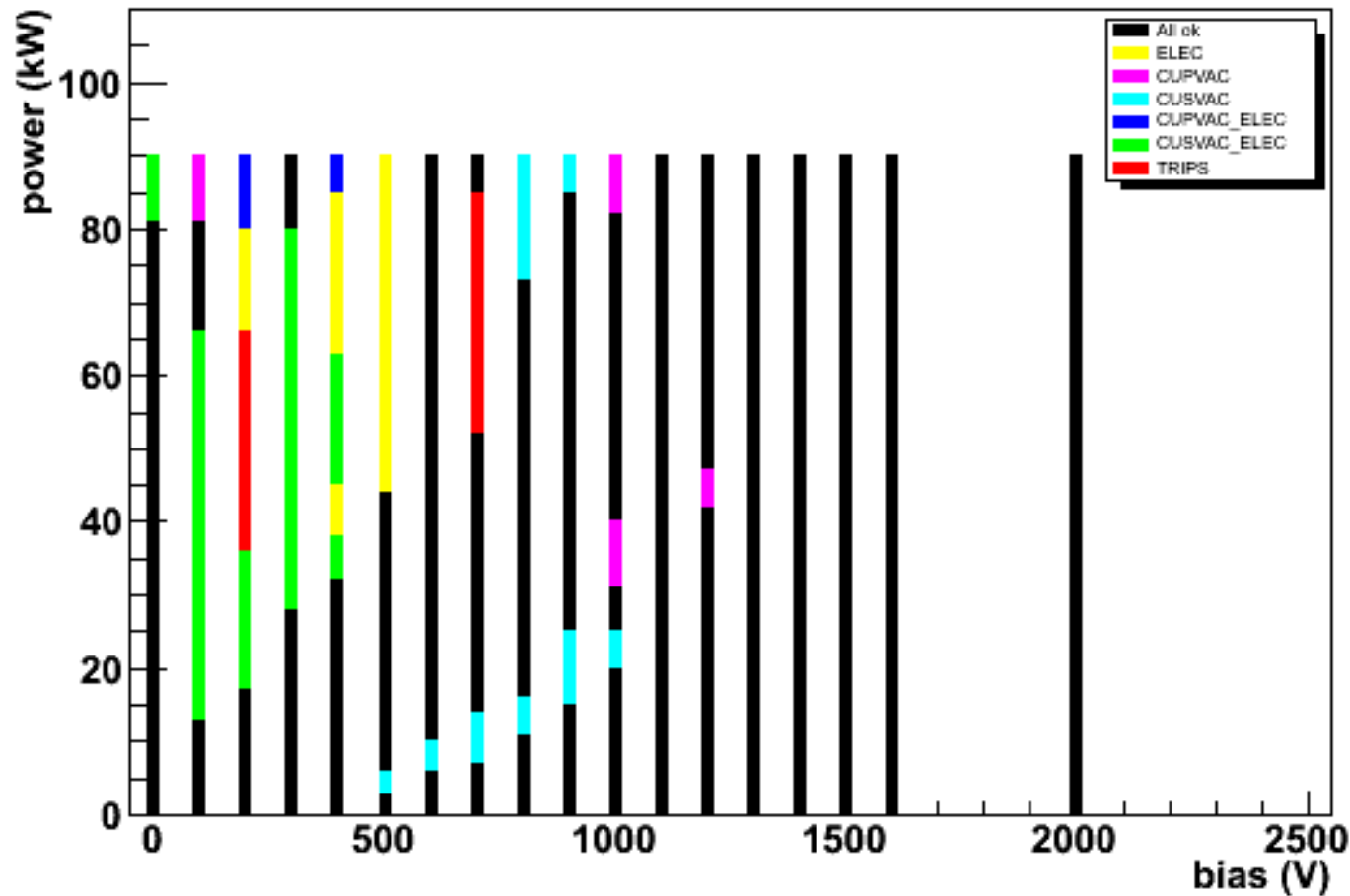
Much of this talk from Tim Koeth's All experimenter's meeting talk on 7/10/06

CCII CALENDAR

- Warm up to begin 1.8K Installation: March 29th
- Installed rebuilt Klystron ~280kW: May 20th
- Cool Down to 1.8K & RF operation began July 6th
- Maximum gradient of 31.3 MV/m reached July 7
- Sustained flattop of 400 μ s at full gradient on July 12
- Planned Power outage July 14
- Mysterious Modulator trips started July 20, fixed July 25
- Trained 3 more operators (one more in works) July 21
- Interlocks testing July 24
- DOOCS and EPICS controls work July 24-26
- Low Level RF work to achieve long flattop in progress
- Piezo Tuner work began July 26.

INPUT COUPLER PROCESSING

Multipactoring map after processing when limited to 90kW of RF



Black = good

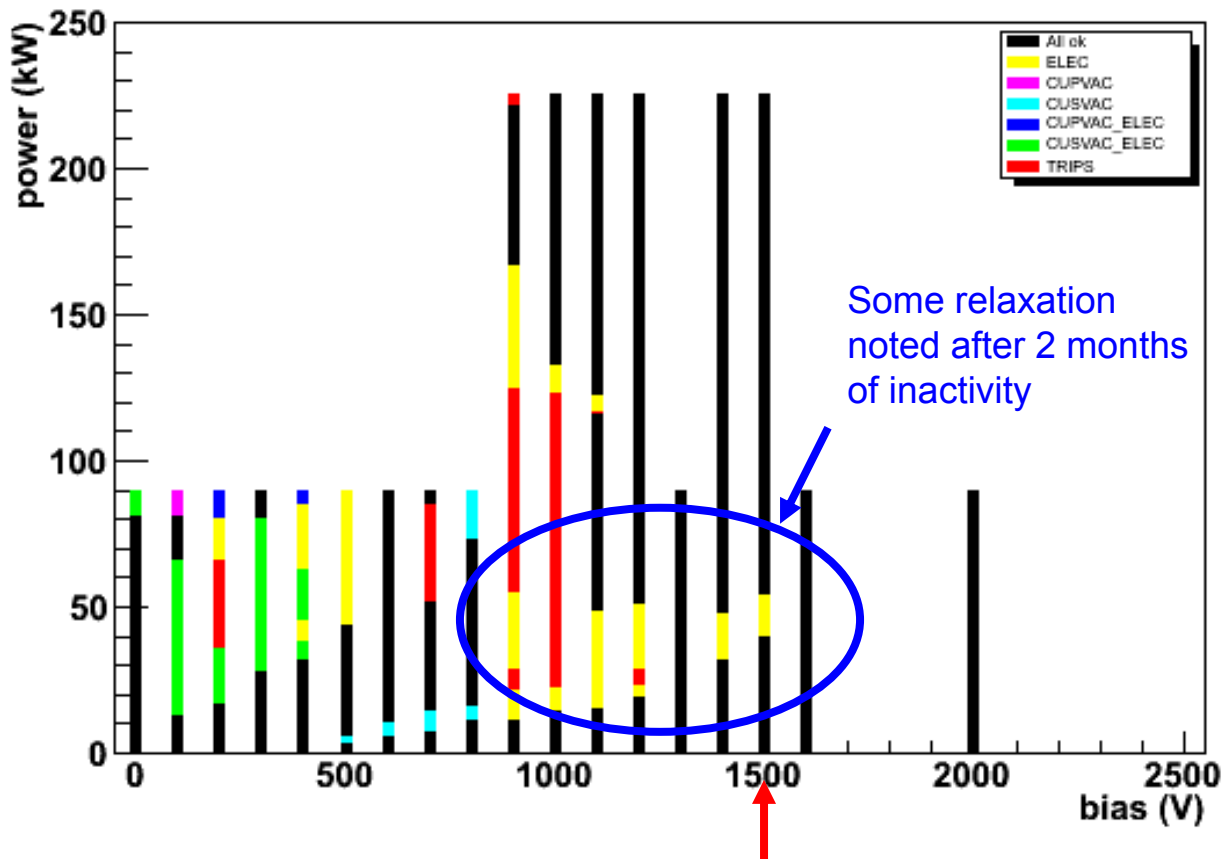
Color = no good



INPUT COUPLER PROCESSING

The rebuilt klystron extended our power capacity from 90kW to 225kW

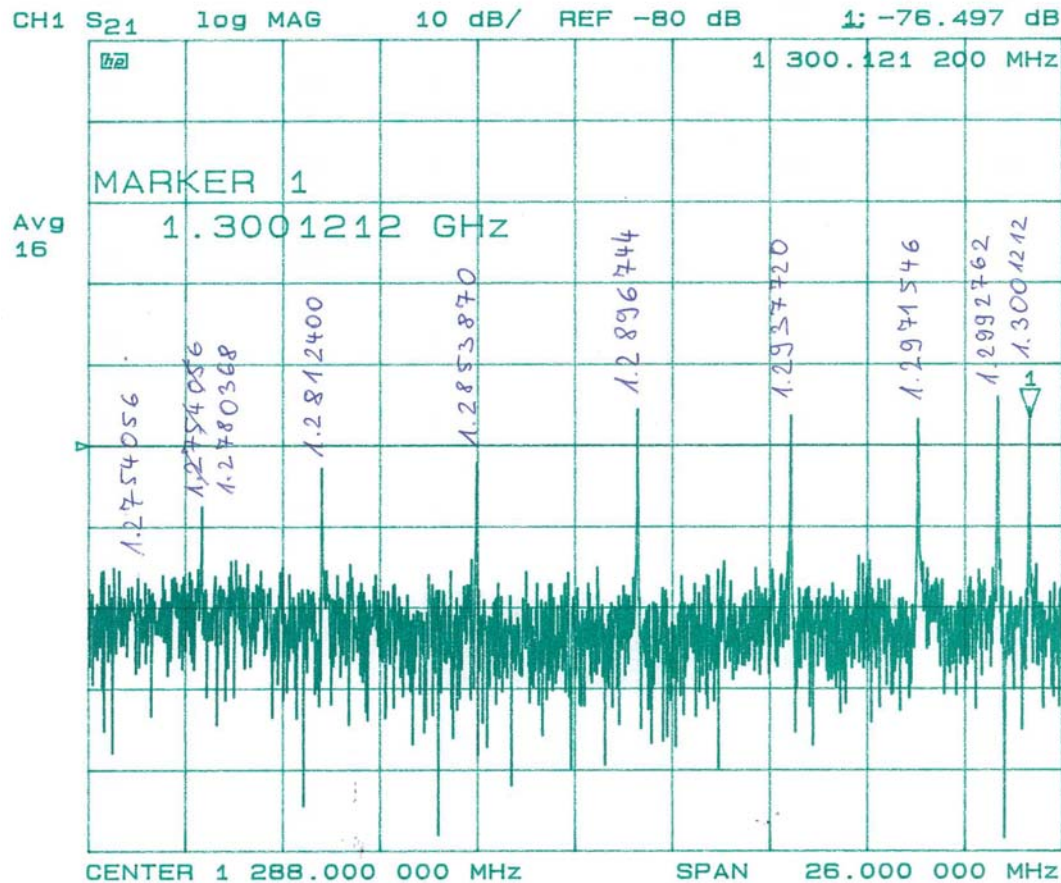
CC2 Coupler



Remember this is off resonance, standing wave with 100% reflected power.

FREQUENCY MEASUREMENTS

At 1.8K



π mode:

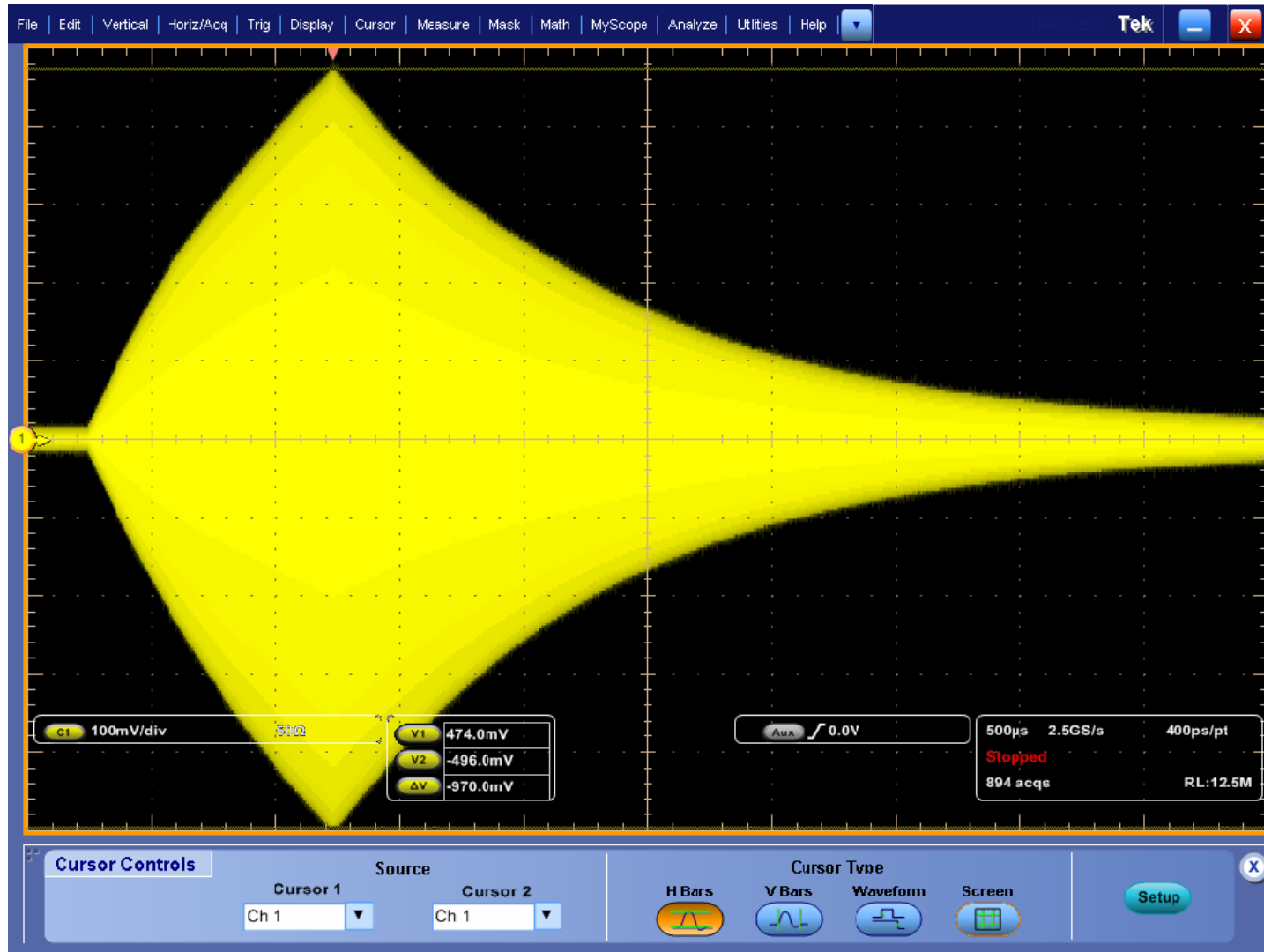
4.5K (atm): 1.3001651 GHz

1.7K(12Torr): 1.3001212 GHz

$$\Delta f = 44\text{kHz}$$

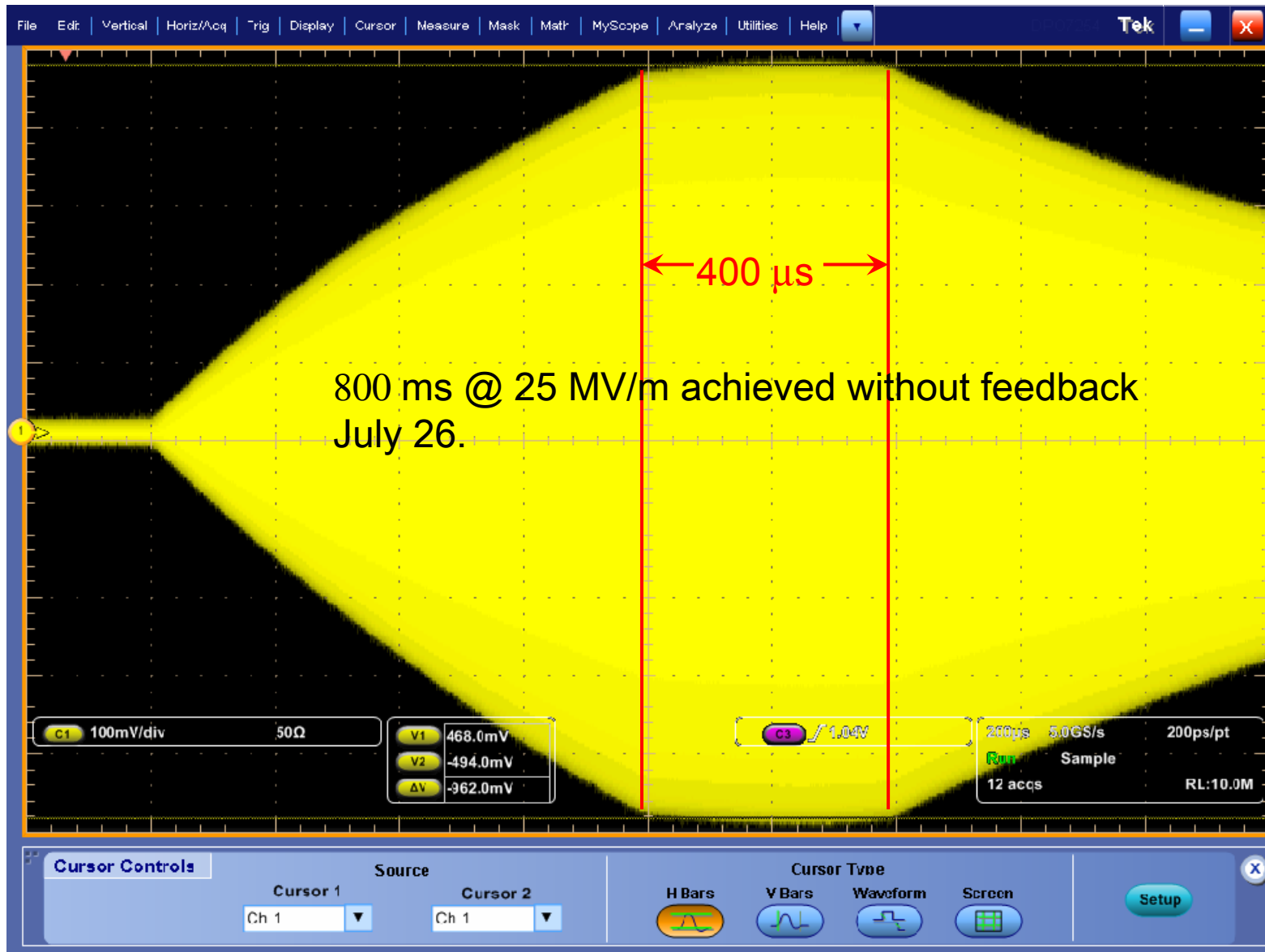
PEAK GRADIENT MEASUREMENT

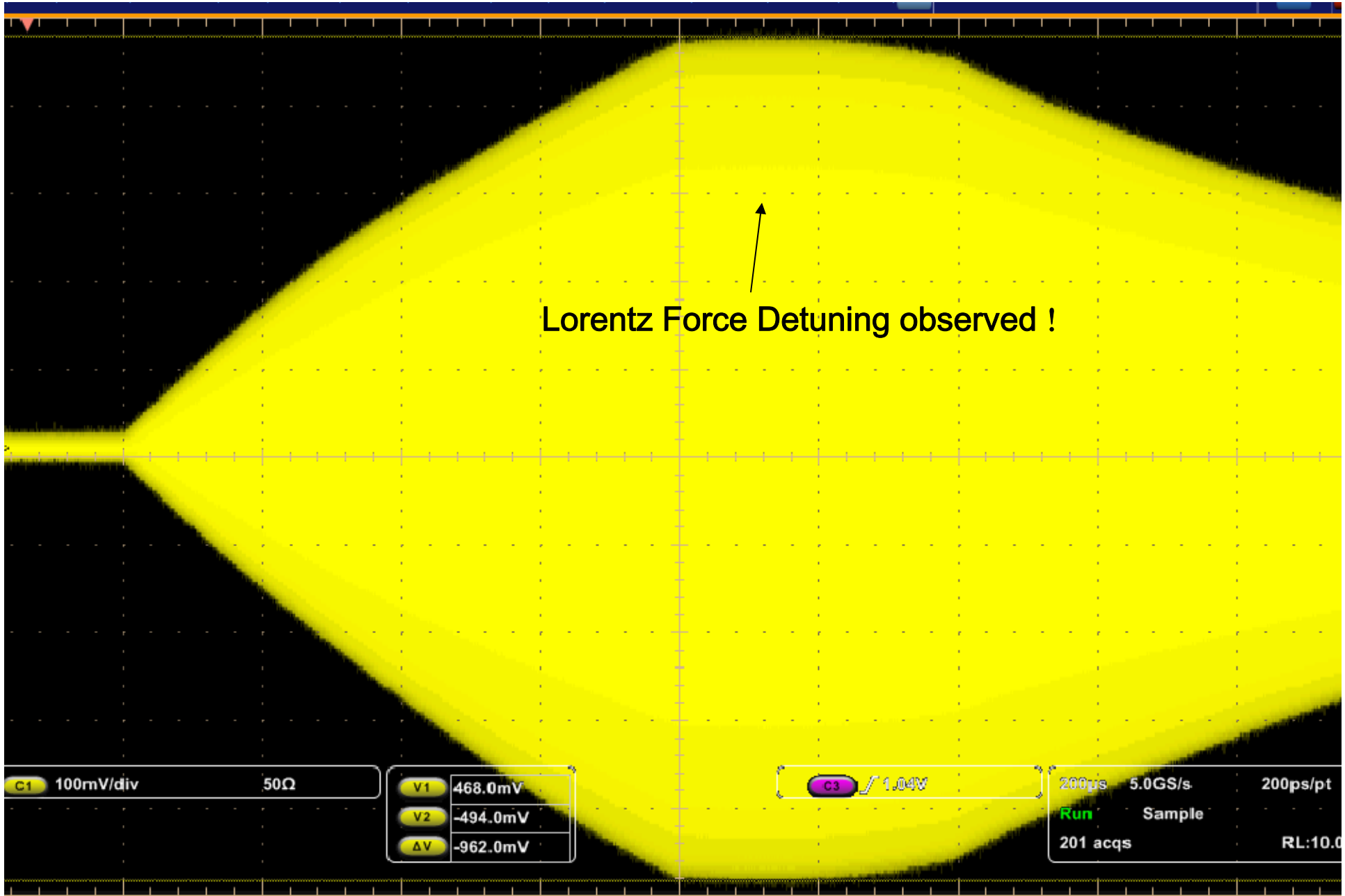
Friday July 7th, 2006



← 31.3MV/m
(+/- 1MV/m)

Long Flattop Work July 12





Lorentz Force Detuning observed !

C1 100mV/div	50Ω	V1 468.0mV	C3 / 1.04V	200ps 5.0GS/s	200ps/pt
		V2 -494.0mV		Run	Sample
		ΔV -962.0mV		201 acqs	RL:10.0

Cursor Controls

Cursor 1	Source	Cursor 2	Cursor Type	Screen
Ch 1		Ch 1	H Bars	Setup
			V Bars	
			Waveform	
			Screen	

NEXT STEPS

- LLRF control: maximum flat top gradient and achieve 800 μ s flat top
- Dark Current and Radiation measurement
- Dynamic Heat Load test $\rightarrow Q_0$
- Testing of new FNAL interlocks
- Automation of coupler processing
 - Test bed for 3.9 GHz
- Dedicated time to LLRF & Piezo Tuner
- Vibration Studies
- Warmup to room temp scheduled for late August to replace tuning motor, piezo work, etc. (complete plan being developed)