Status of the CALIFES RF gun and photocathode preparation

- **installation of RF gun complete**
- installation of wave guides (part I), pumping + leak testing: done

next steps (present schedule)**:**

- installation of water chiller for RF gun: done (pipes connected)
- low-power RF tests: week 21

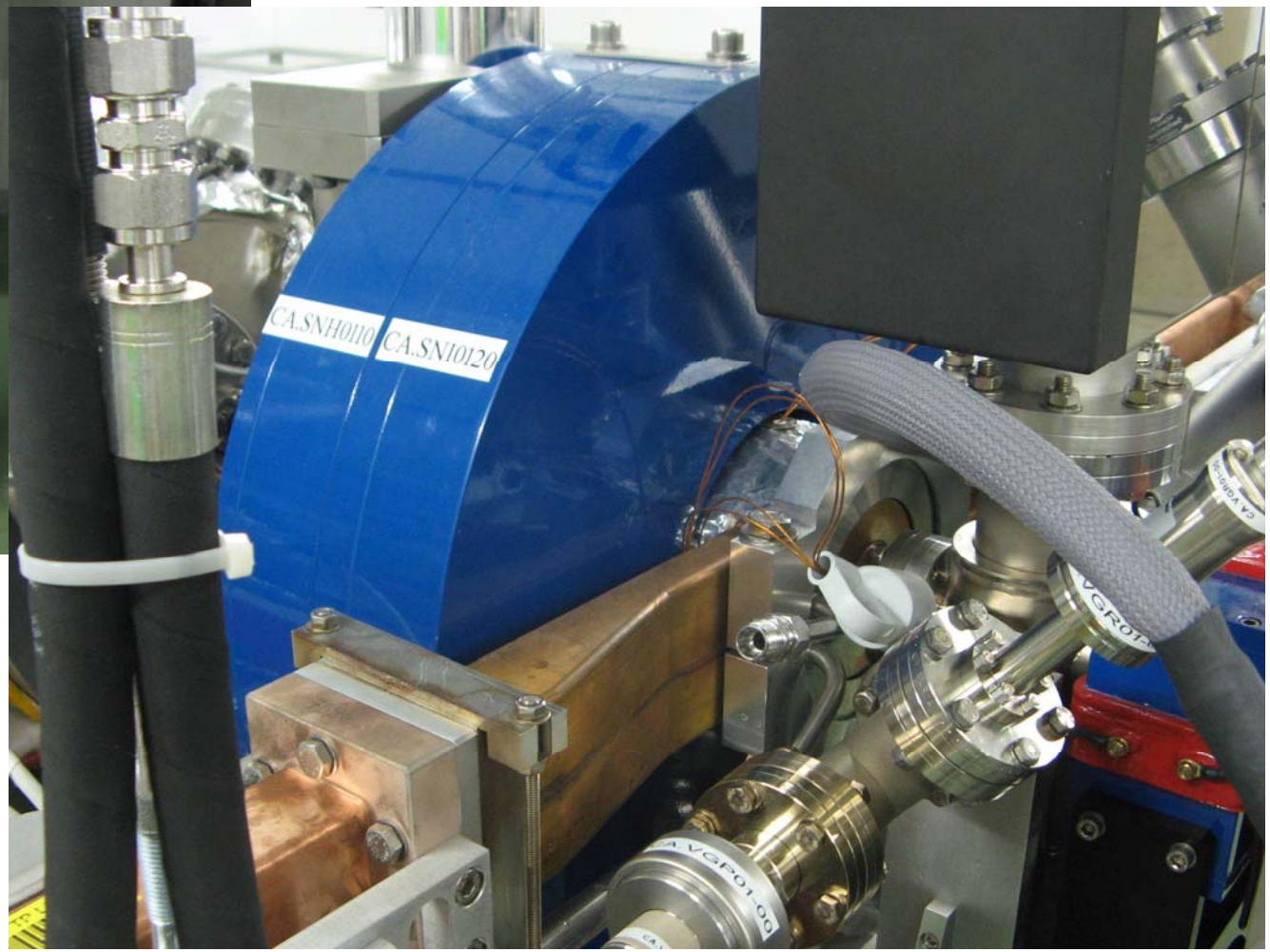
- bake-out, leak testing: weeks 22+23

- installation of wave guides, part II: weeks 24-26
- RF commissioning with Cu plug in place

- final tests and photocathode production (to be done just before first beam !)

Erratum

15 May 2008 12:00


CA.SNH0110
CA.SN10120

Status of the CALIFES RF gun and photocathode preparation

Cooling water connected: Chiller to RF gun; approx. 3 bar

11:30 today:
SERIOUS water leak (... to the outside, for sure;
very likely NOT to the inside...)

Leak not from pipes nor from connections...
...somewhere “inside”, hidden by the solenoids

Conclusion (updated 15 May 2008)**:**
Difficult to predict today what status will be at the end of July 2008

any questions to:

CALIFES RF gun, preparation chamber etc.

?

Status of the laser system (CERN part)

Reminder (last CTF3 committee meeting)**:**

- IR -> green : 13% conversion efficiency (specs: 35%)
- green -> UV: 4.3% conversion efficiency (specs: 35%)

NOTE: the **beam-sizes** used are much smaller than specs

hypothesis to explain low conversion efficiency:

significant DC component in the beam (not just 10 ps pulses)

Progress report

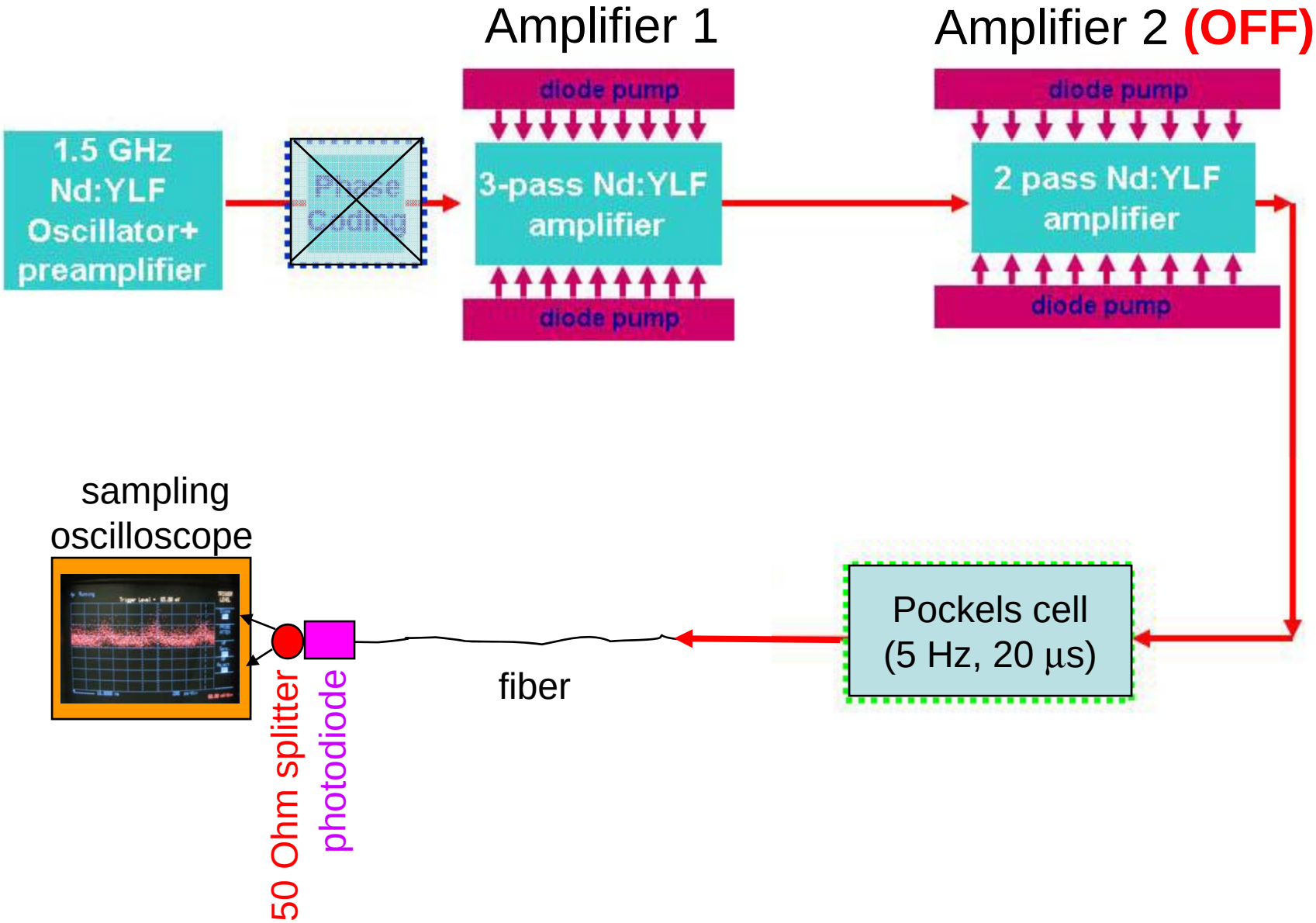
M. Petrarca visit to RAL – discussion with M. Divall, I. Ross

Main result:

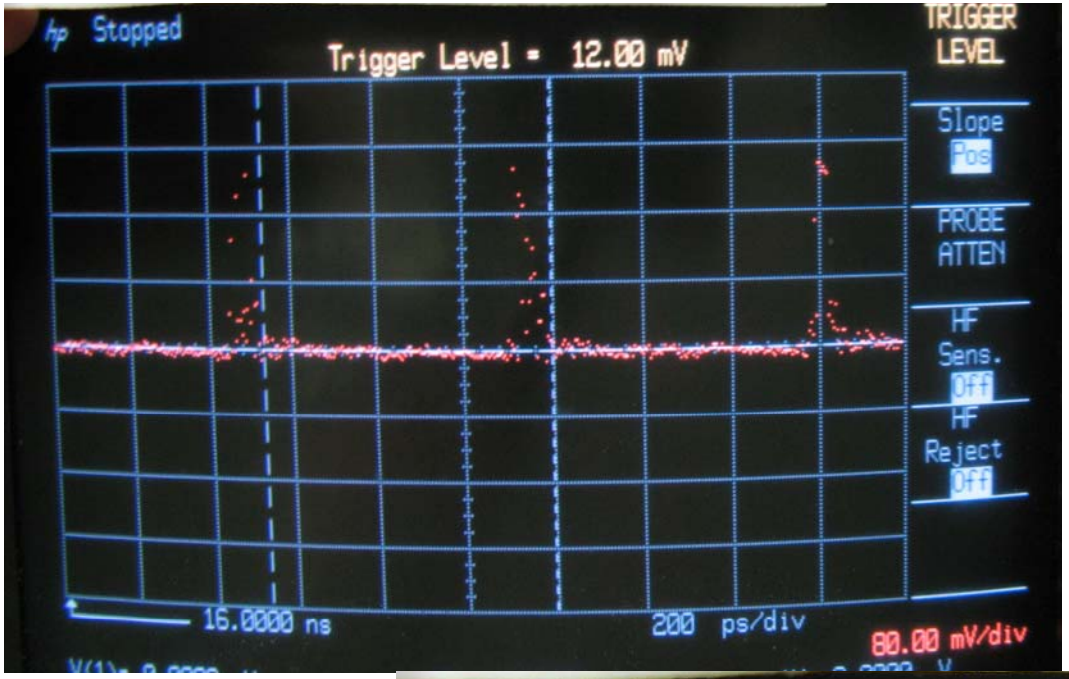
due to the high amplification factor in Amplifier 1,
any stray, off-axis, out-of-time light rays are amplified
-> looks like ASE (Amplified Spontaneous Emission)

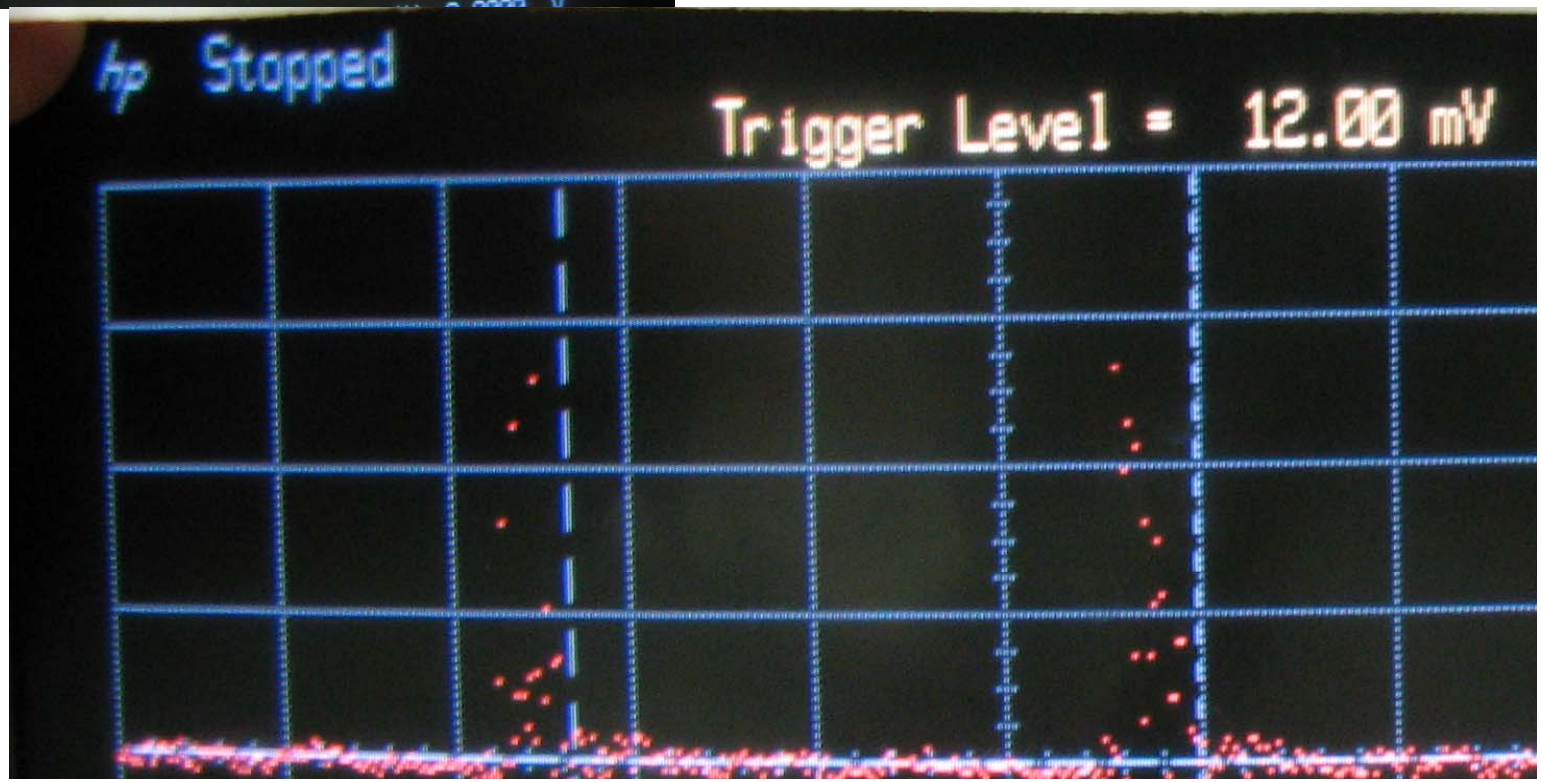
this would explain (1) halo observed after Amplifier 1
(2) “DC component” between pulses

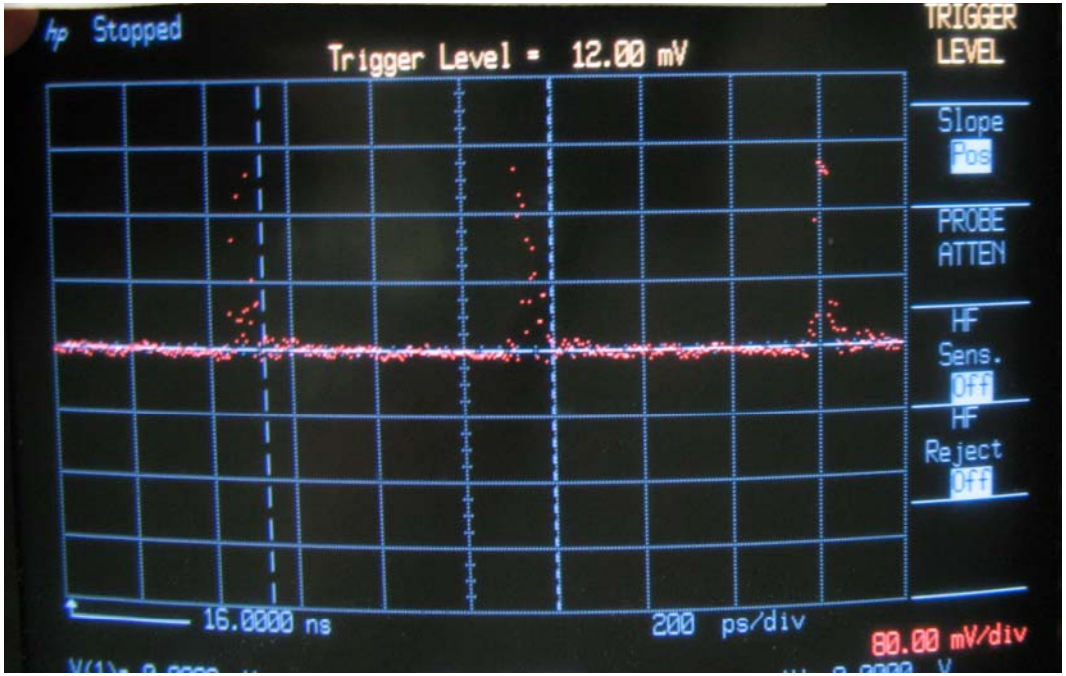
RECENT EXPERIMENTAL RESULTS - PRELIMINARY


Amplifier 1
Amplifier 2 (OFF)
diode pump
1.5 GHz
Nd:YLF
Oscillator+
preamplifier
Phase
Coding
3-pass Nd:YLF
amplifier
2 pass Nd:YLF
amplifier
diode pump
diode pump
sampling
oscilloscope
Pockels cell
(5 Hz, 20 µs)
fiber
50 Ohm splitter
photodiode

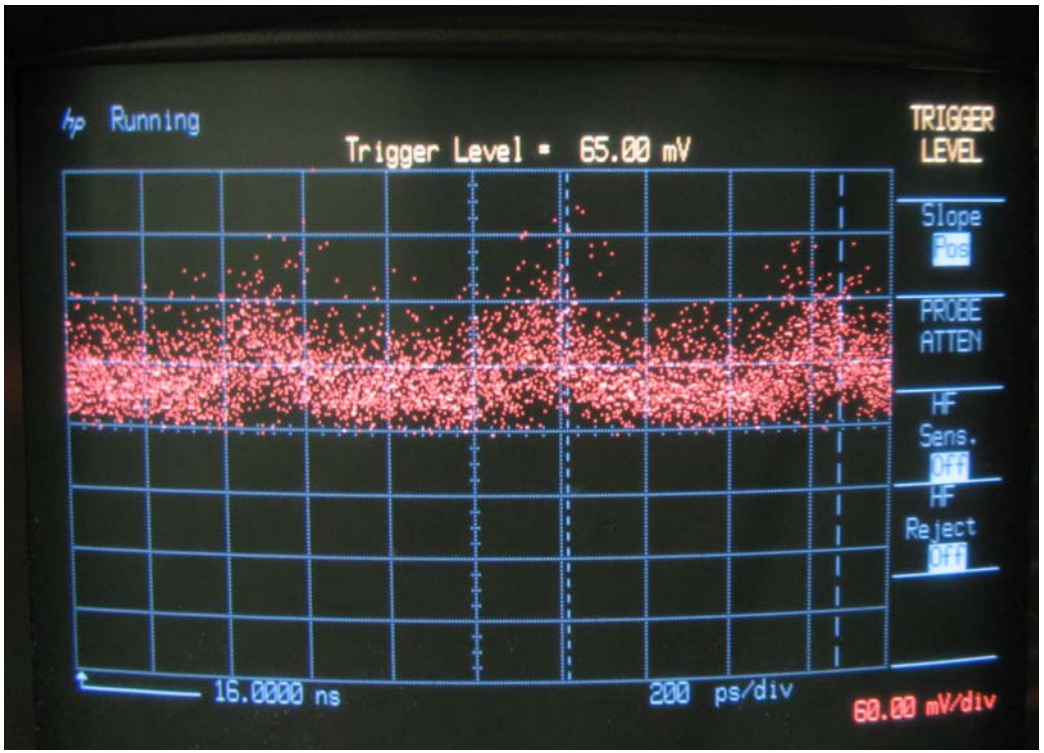
Amplifier 1 OFF



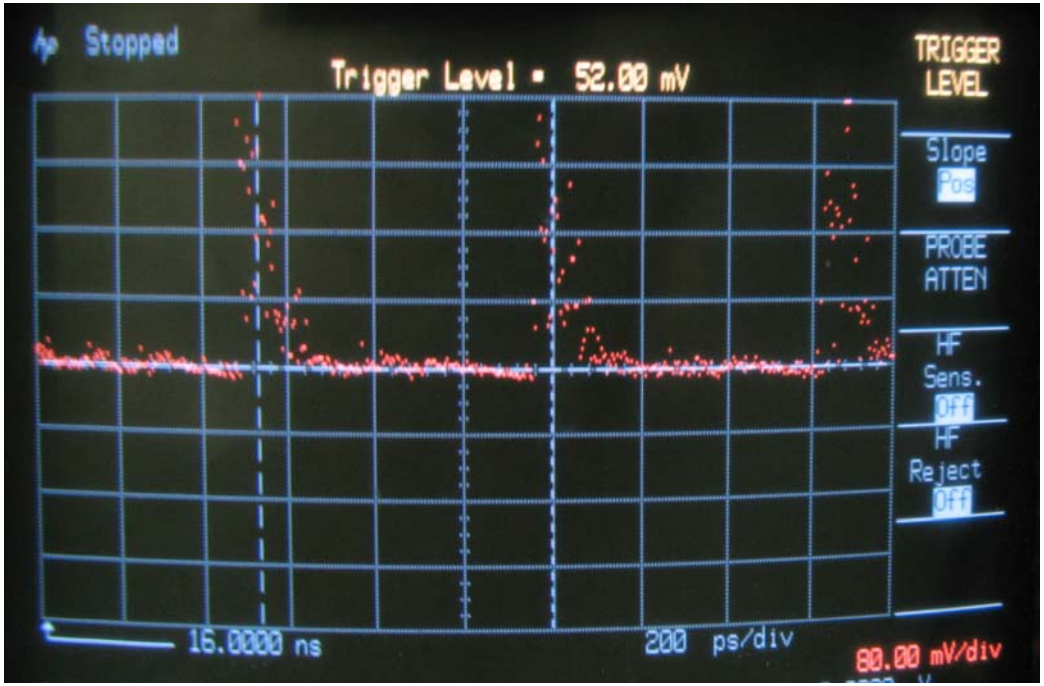




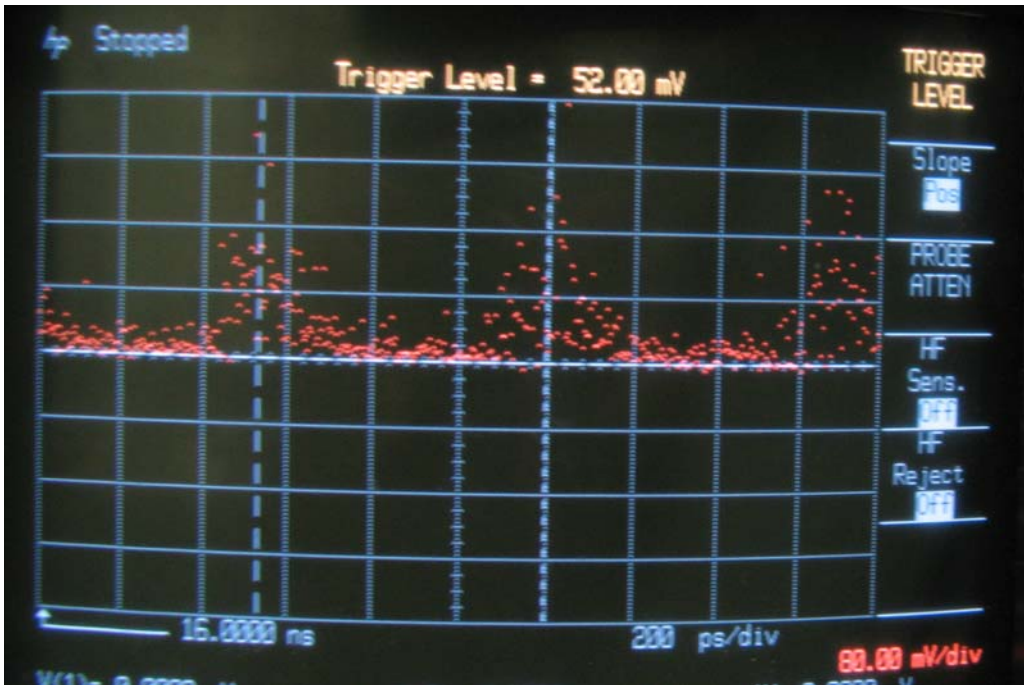
Amplifier 1 OFF



Amplifier 1 ON (90 A)



Amplifier 1 ON (65 A)



Amplifier 1 ON (75 A)

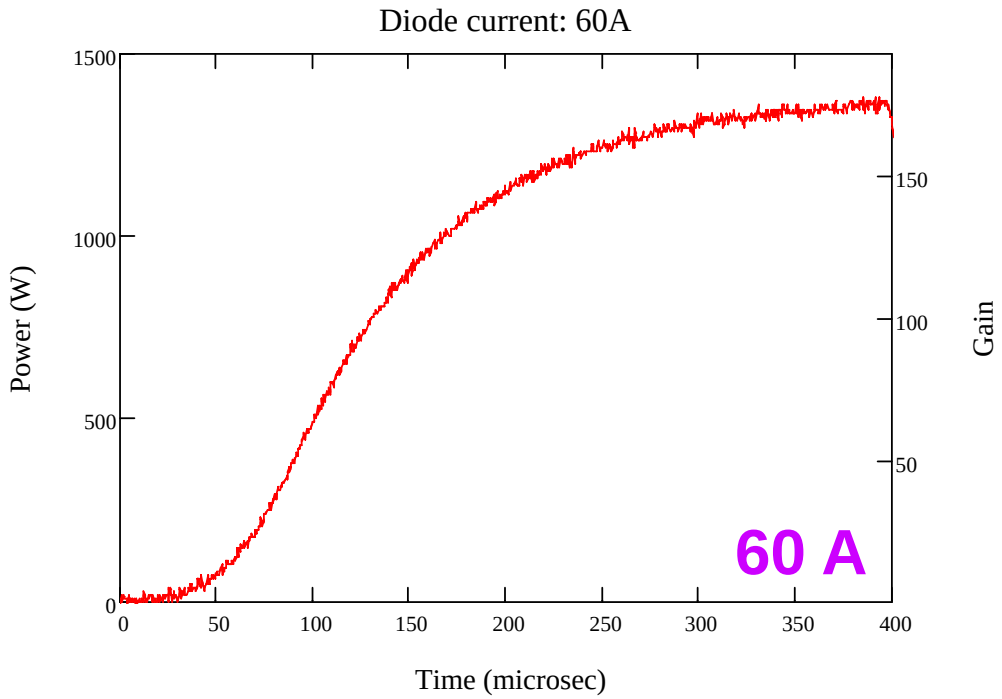
QUESTION:

how much power do we loose,
when using Amplifier 1 at 65 A
instead of the nominal 90 A ?

ANSWER:

... all the five “drivers” (power supplies) for the diodes of Amplifier 1 have a controls problem and can not be powered ...

...Murphy’s law...

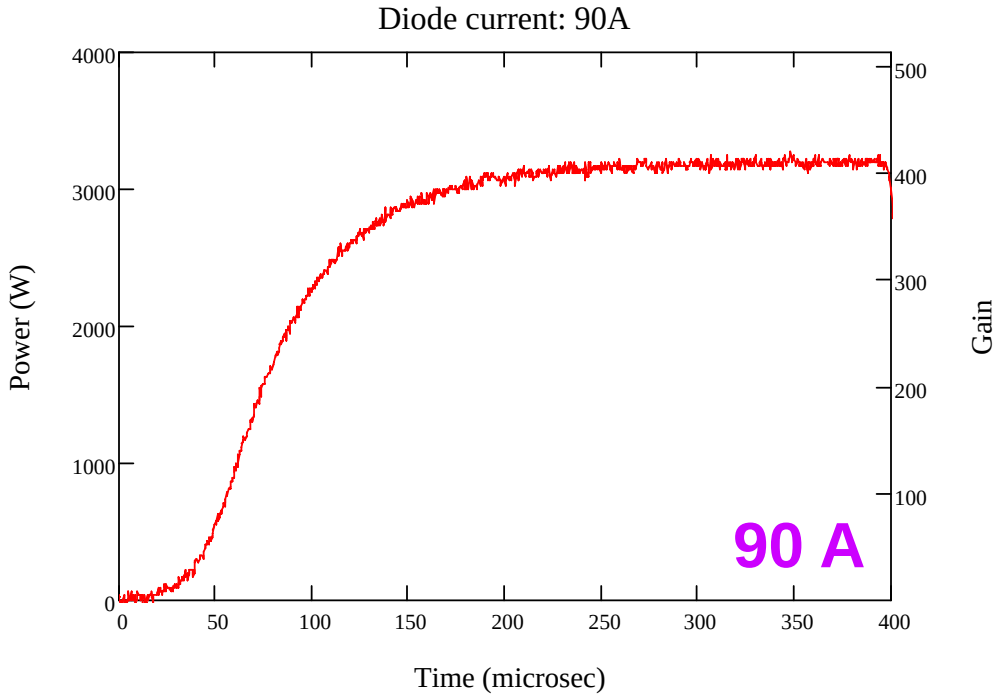


Power after Amplifier 1:

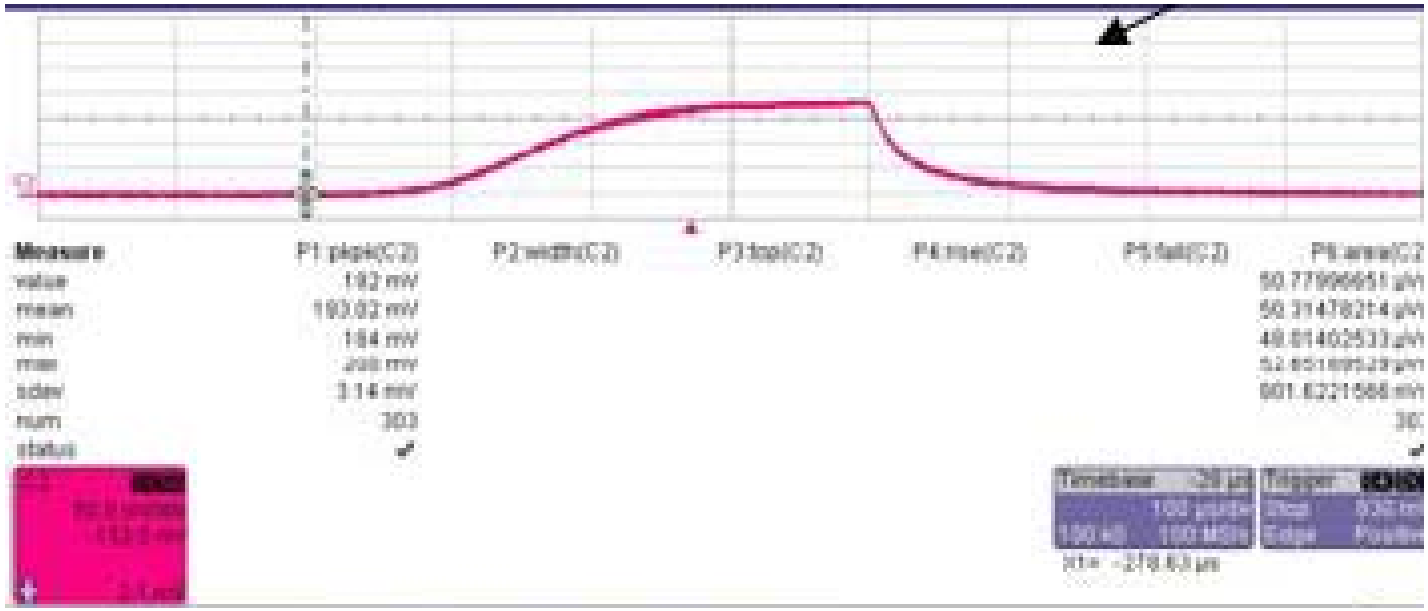
data taken
24 November 2006

<u>Conclusion</u>:

at 65 A, we are at about
50% of <u>average</u> power

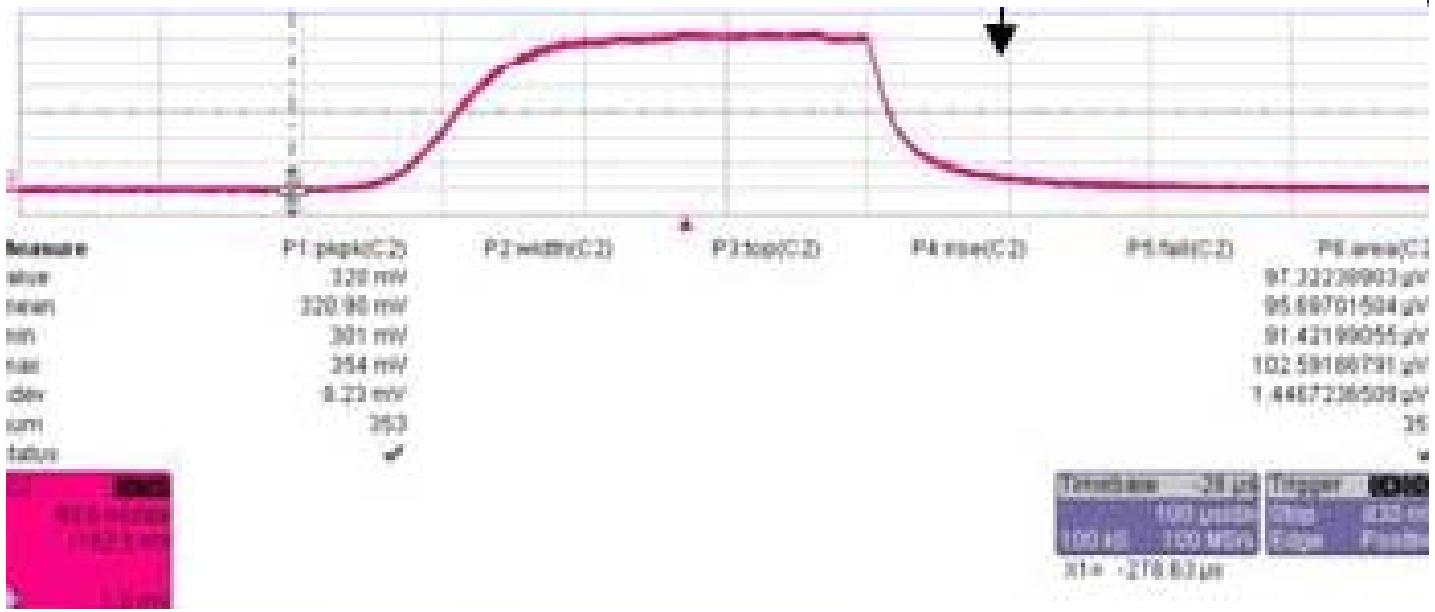


65 A



data taken on 14 May 2008 p.m.

90 A



laser system (CERN part) – cont.

next steps:

[... improve triggering of the scope ...(?)]

(1) investigate whether we can work with Amplifier 1 at 65 A
(approx. 50% of beam power)
-> resulting power and pulse structure after Amplifier 2
-> conversion efficiency to UV
several weeks of work

(2) investigate cures to Amplifier 1, decide on action (**x** weeks)

(3) implement modifications (**xx** weeks)

CONCLUSION (...not changed...):

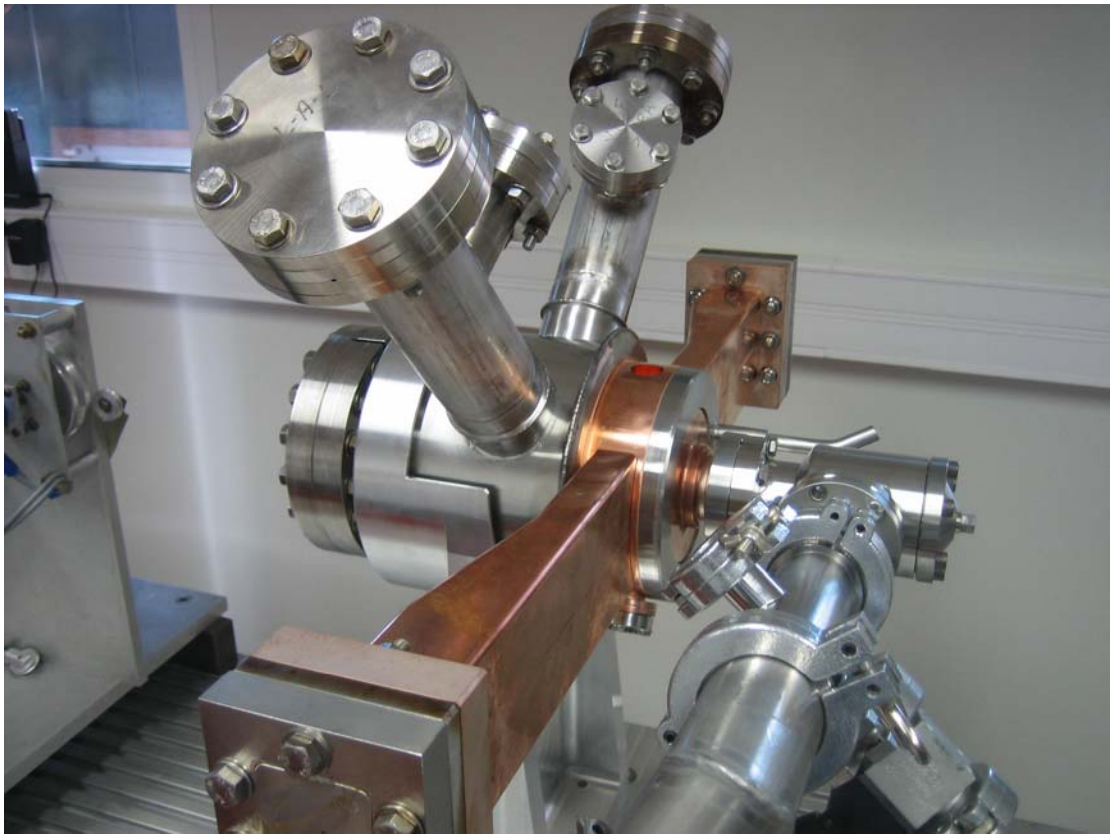
Difficult to predict today what status will be at the end of July 2008

any questions to:

Laser (CERN part)

?

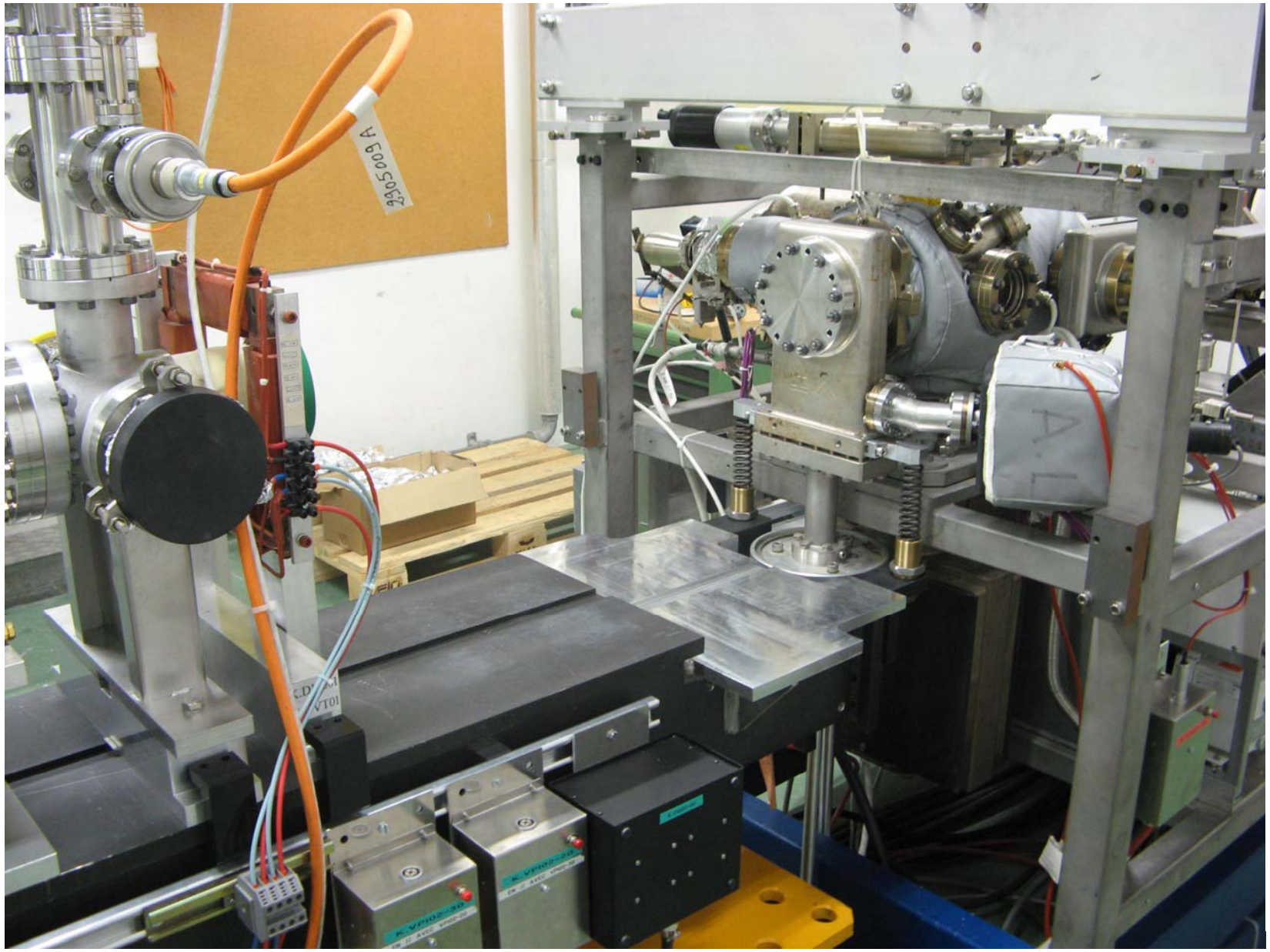
Status of the PHIN photoinjector



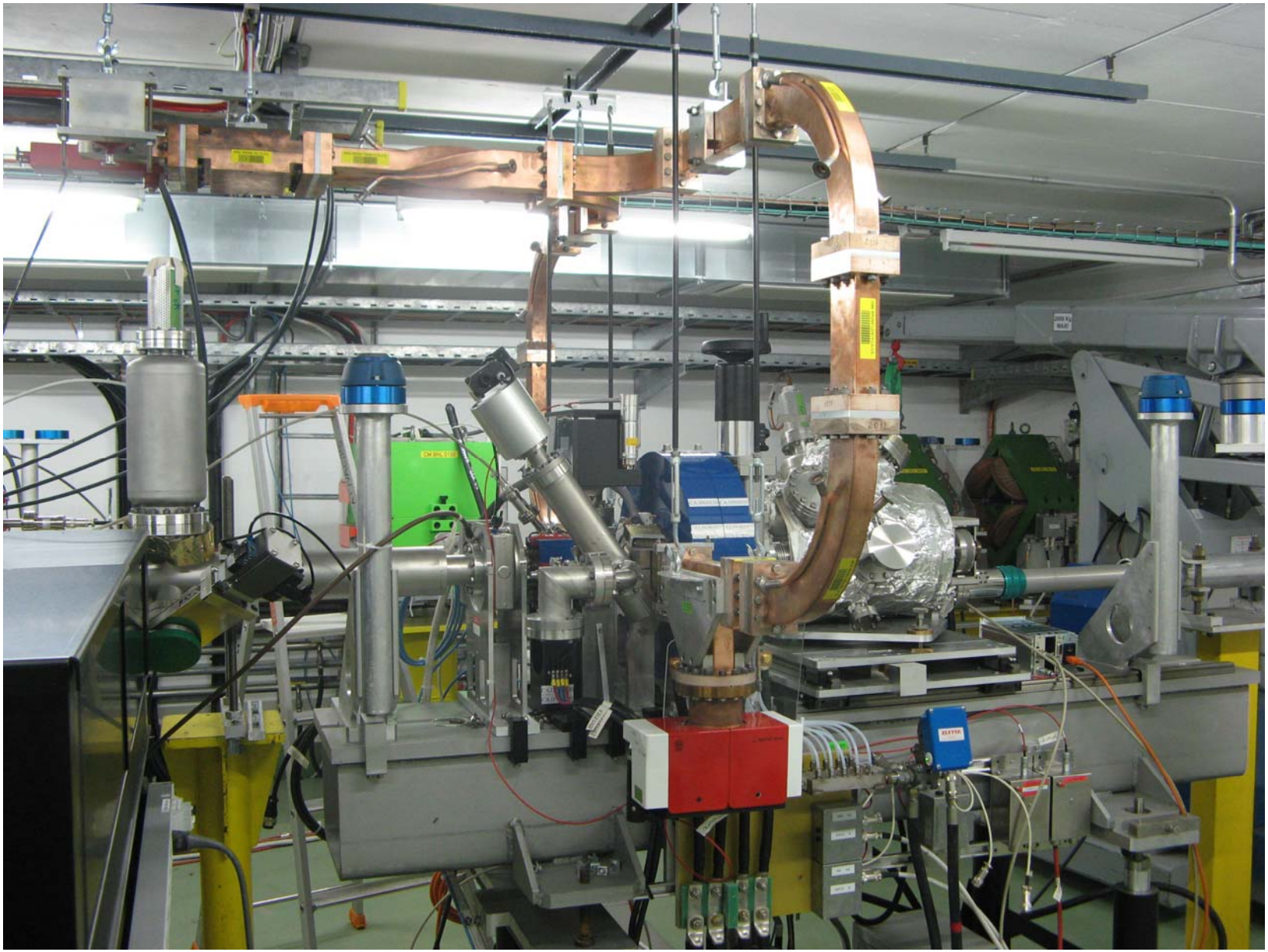
PHIN-2 gun brazed at LAL – tested o.k. - ready for shipment

delivery of PHIN-2 gun from LAL to CERN: 20 May
preparation for bake-out, installation + assembly
(with help from LAL – MERCI!), waveguides, etc.

? ready in September ?



PHIN in CTF2 - 14 May 2008



CALIFES RF gun - 14 May 2008