Summary of the first Liyuan's visit,5 July

LASER1:

- Adjust only coupling of the main fiber: power on the Matacq back to normal, ~300-400ADC.

LASER3:

- New crystal. Replace logic unit. All OK.

LASER2:

1) Laser power distribution:

Main transformer output changed from 230V to 207V : after that still not able to switch on laser, always an electrical arc on main power supply → replacing the logic unit help.
2 power supply which seems in cause and 1 repaired by Quantronix was not damaged !!
Returned 2 logic units for reparation.

2) TiS laser:

- Our conclusion is that the LBO crystal is damaged in discussion with Quantronix's engineer;
-After Liyuan's visit, TiS laser need tuning all the time (after switch on laser) to recover blue light. 3 actions are taken: Ordered new crystal from CASTON and Quantronix, order spectrometer and LBO optical mount .

Liyuan's visit 29/08-2/09

From 15 to 21 August:

No laser expert available, only shifter on call, as foreseen in advance and well known.
No spare blue laser thus under pressure when 2 incidents occurred:

1) Chiller Neslab for blue laser: unstable and thus finally switch OFF because can't reach setting temperature. No major impact on blue laser: lower power for sometimes but laser most of the time available thanks to efforts;

2) Main power cut: Laser DAQ Kernel upgrade automatically after PC reboot → unable to restart properly laser DAQ;

Laser2: LBO from Caston delivery schedule known by end of August.

→ To be more confident and to be sure all will be solved during the 1 week technical stop, mainly recover the blue laser, Liyuan's visit has been schedule for this period.

Liyuan's visit 29/08-2/09

Summary of the work done:

1) The Neslab problem is understood due to low line voltage *(204 V)* caused by recent adjustment of line voltage for the 3 phase transformer. After changing power to a regular CERN line (220 V), all three Neslab units work well with no problem (1 spare OK);

2) **Laser2** is in operation. By using a spectrometer it was found that there was a secondary mode, which eats up pumping power and causes degradation of the Ti:S pulse intensity. An over night test show reasonable stability with no degradation. The Caston LBO crystals were not yet used since the data sheets arriving with the crystals indicate that its coating is not optimized for 880/440 nm. Liyuan will call this company before installing this crystal.

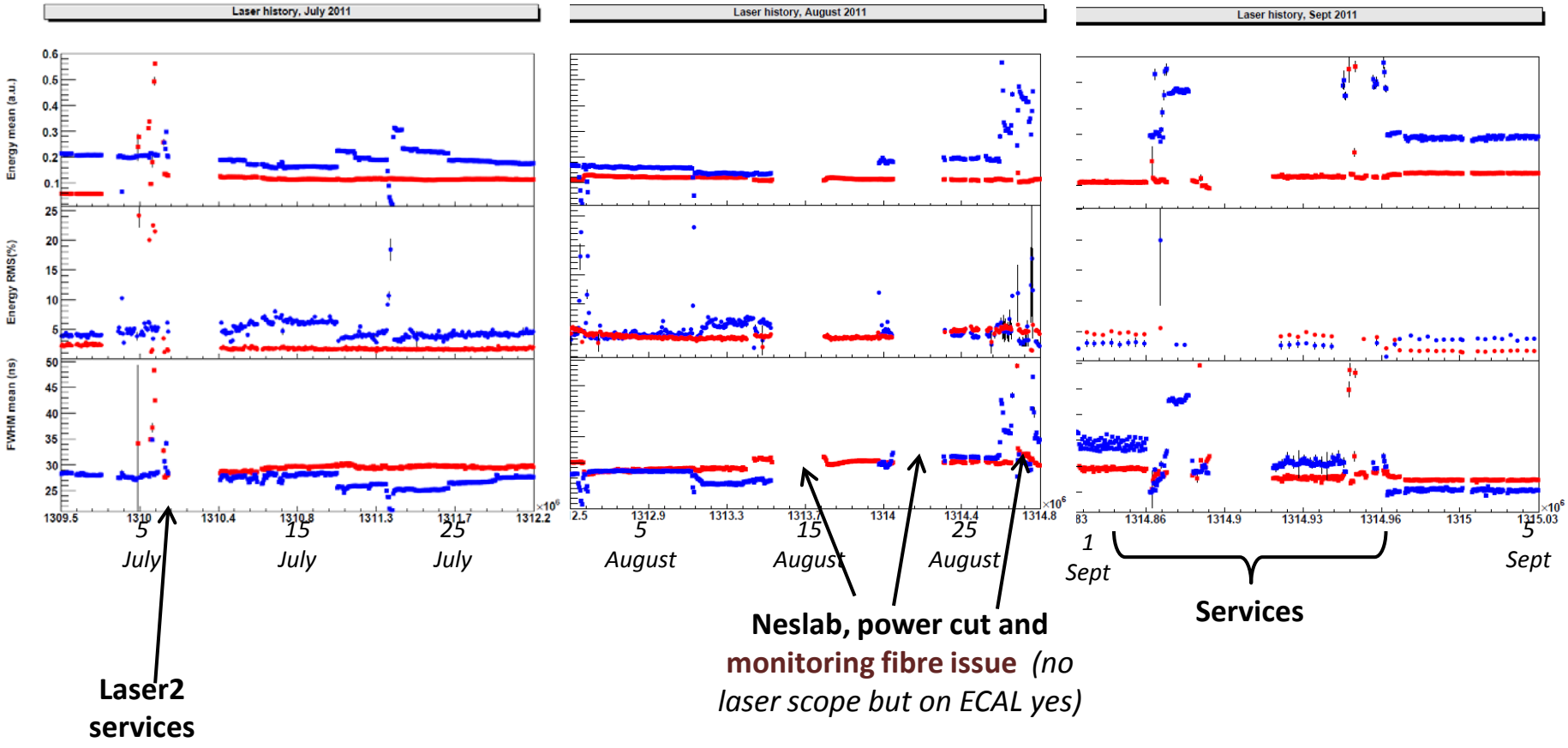
Laser2 : can be used as a spare

3) **Laser1** and **Laser3**: usual maintenance, no problem.

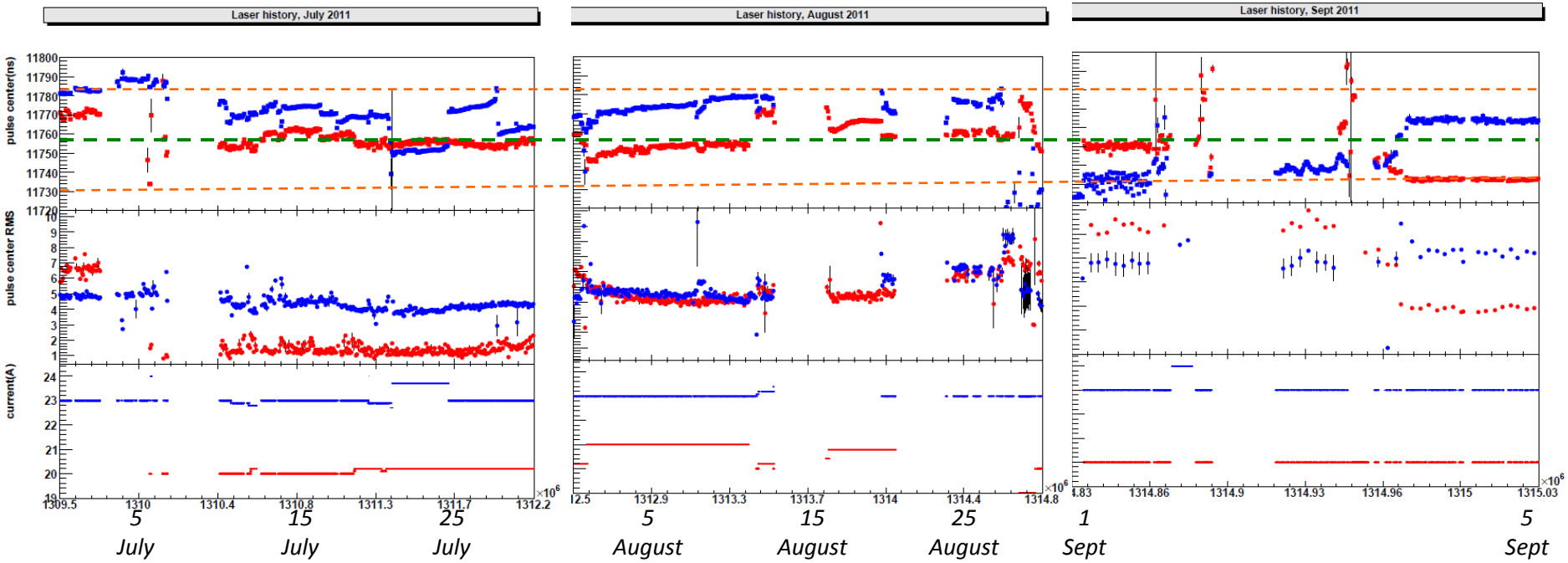
4) AC smart unit: remove this device. It was foreseen at beginning to reboot GPIB converter and optical switches in case of trouble we get 2 years ago. The sequence stopped twice in a week because of lost of communication (shutter was stack) such it was decided to remove it from the chain.

5) Agree to have Guy Chevenier as a second expert on call, near future.

Laser plots from slow monitoring, July/August

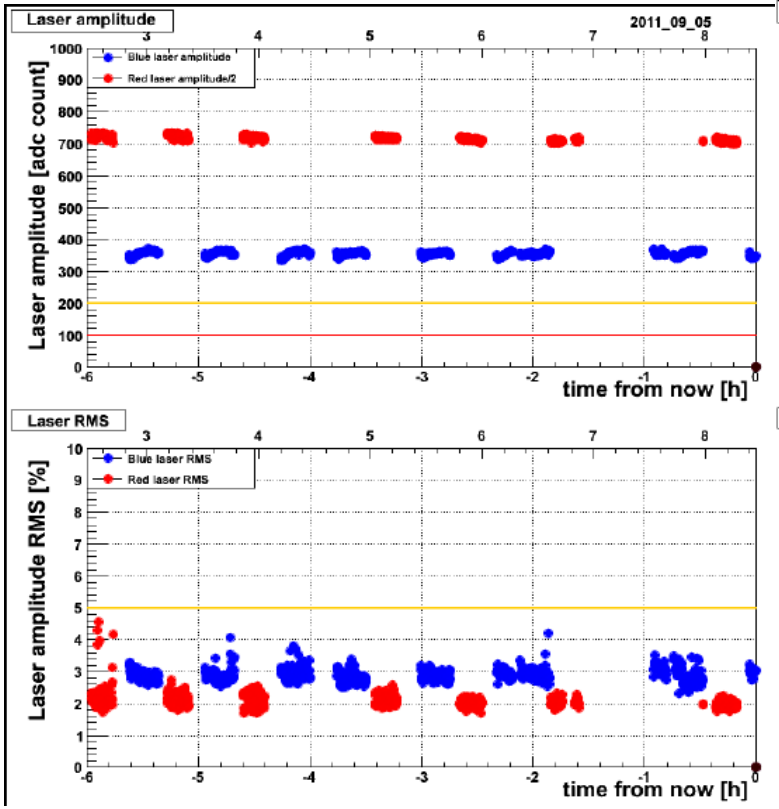


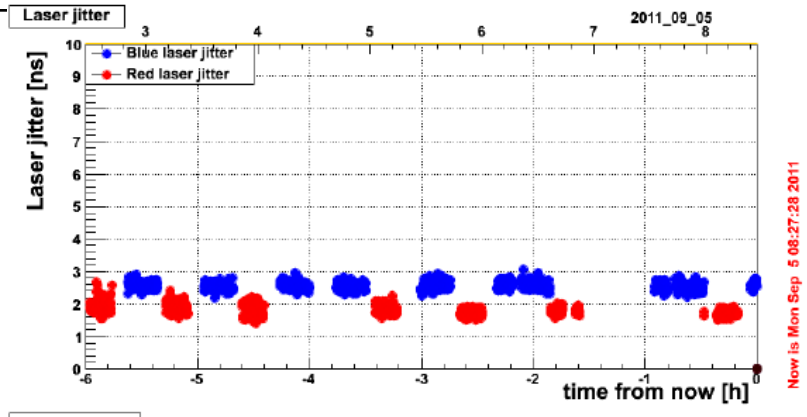
Laser plots from slow monitoring, July/August

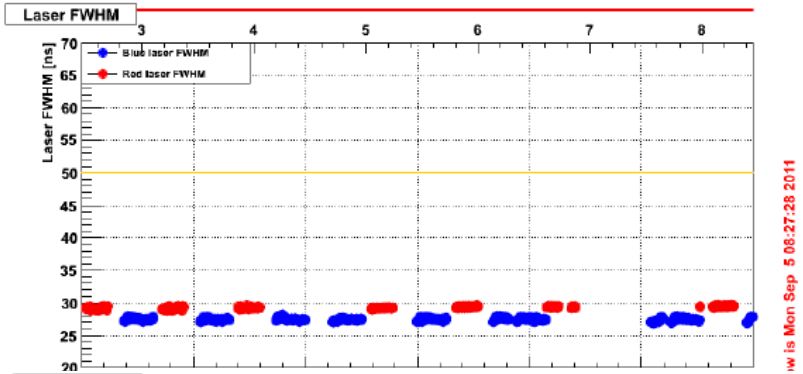


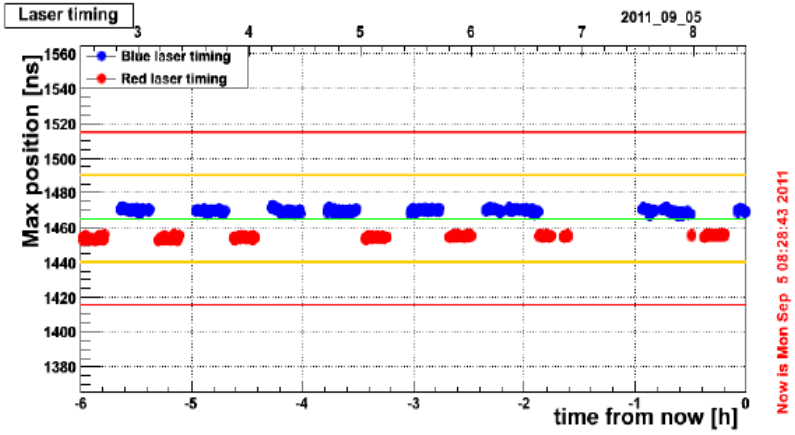
RMS pulse center < 9 ns all the time despite Neslab issue

Laser plots from Matacq 5 Sept



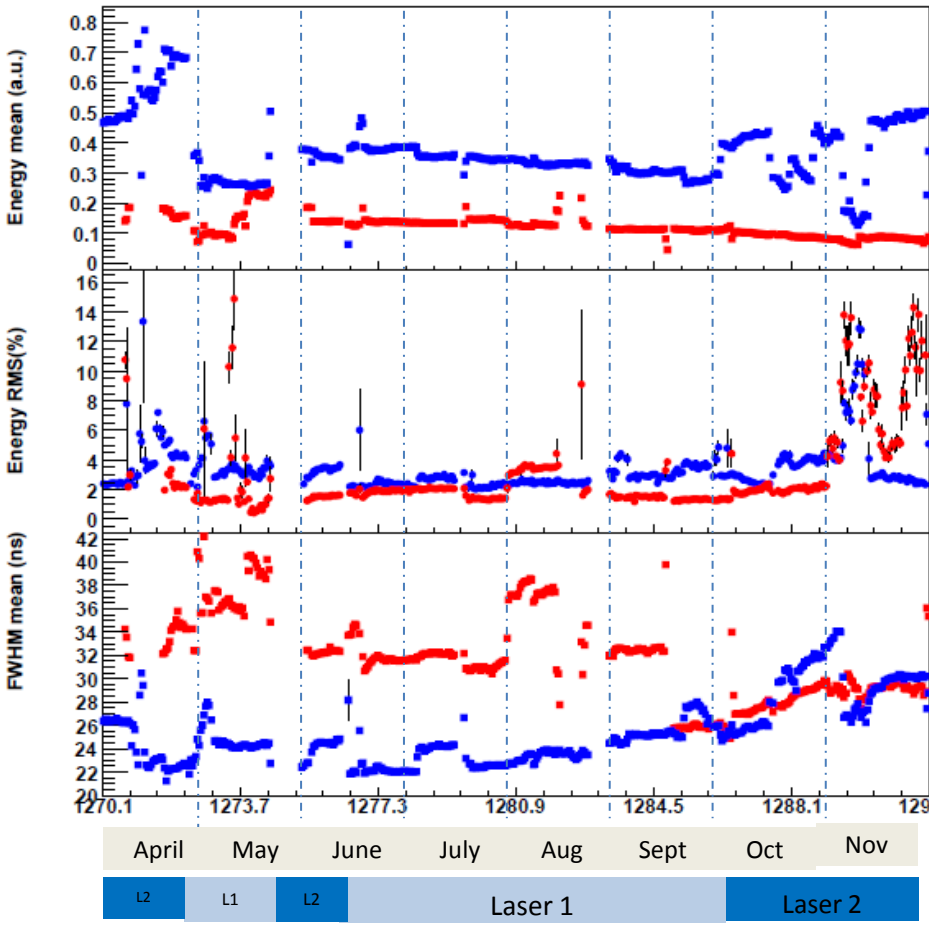




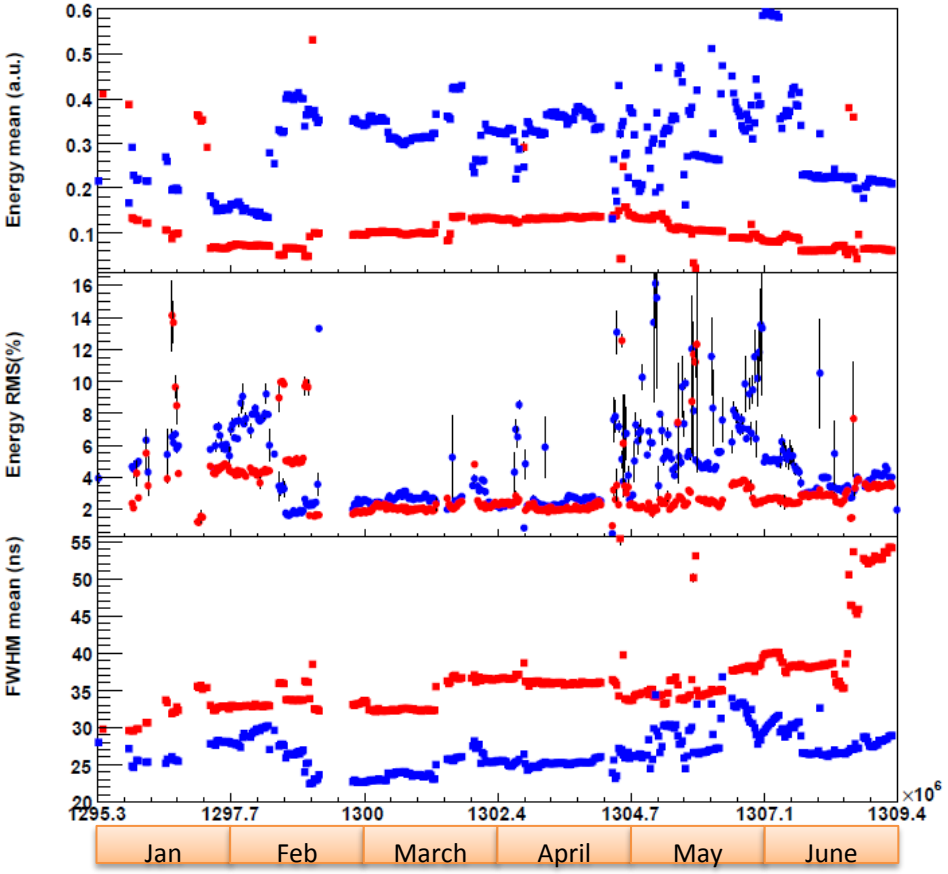


Matacq value after services	BLUE	RED	Limits
Amplitude (ADC)	350	700	> 200
Amplitude RMS %	3	2	< 5 (<10 from laser design)
Jitter (ns)	2.5	2	<10
FWHM (ns)	27	30	< 30 (< 40 from laser design)

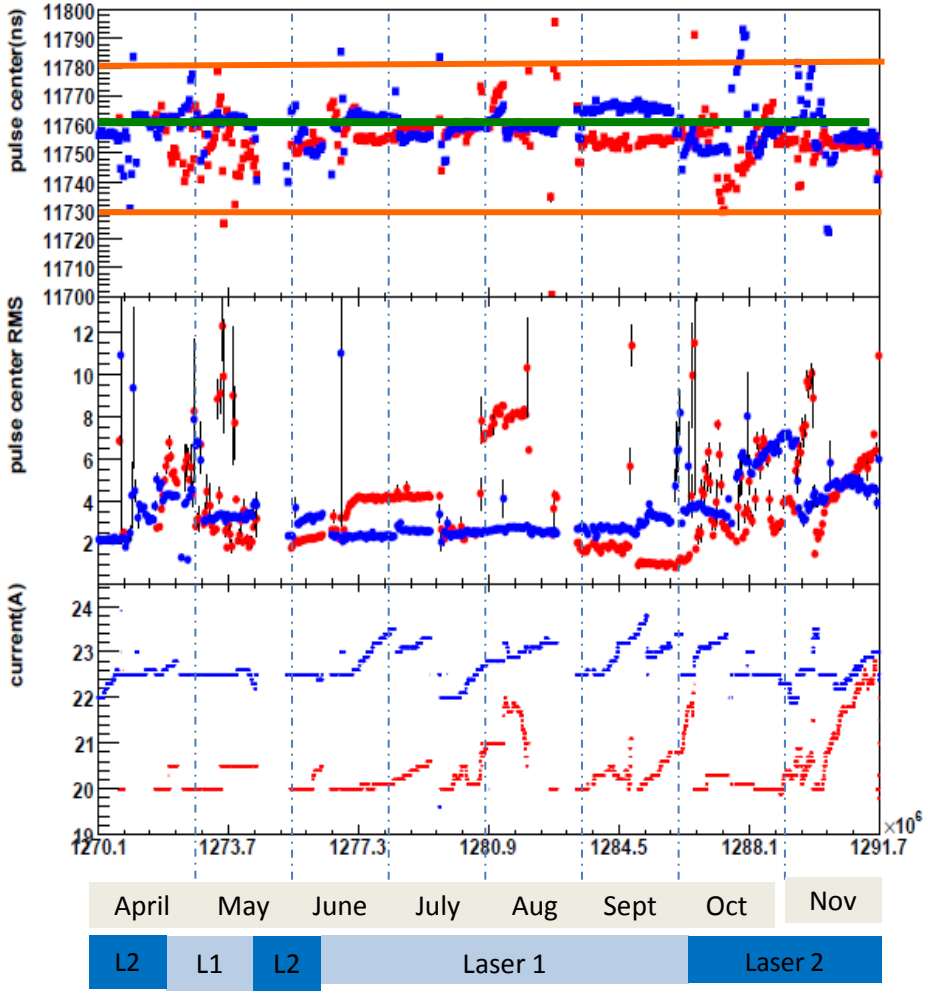
Laser plots 2010



Laser plots 2011



Laser plots 2010



Laser plots 2011