Elastic Lidars
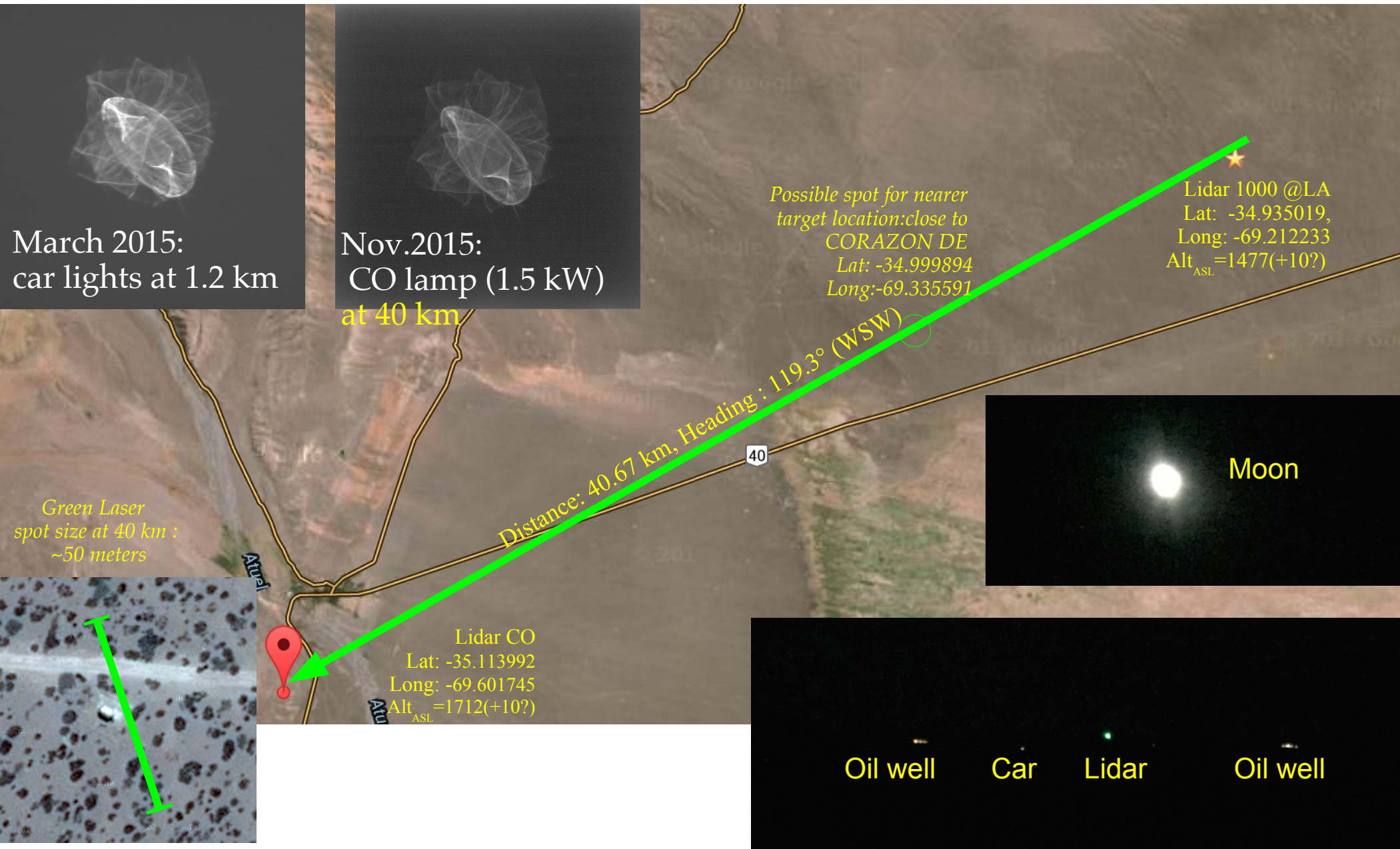

R.Mussa
Torino Richieste Servizi Base 30/6/2016

Lidar to Lidar: Coihueco ↔Loma Amarilla

In April 2016, we used the Coihueco lamps to compare the PSF of the old lidar mirror with the new one, shifting the CCD camera along its focal axis.

March 2015: car lights at 1.2 km

Nov.2015: CO lamp (1.5 kW) at 40 km

Possible spot for nearer target location:close to CORAZON DE Lat: -34.999894 Long:-69.335591

Lidar 1000 @LA
Lat: -34.935019,
Long: -69.212233
Alt_{ASL} =1477(+10?)

Distance: 40.67 km, Heading : 119.3° (WSW)

Green Laser spot size at 40 km : ~50 meters

Moon

Lidar CO
Lat: -35.113992
Long: -69.601745
Alt_{ASL} =1712(+10?)
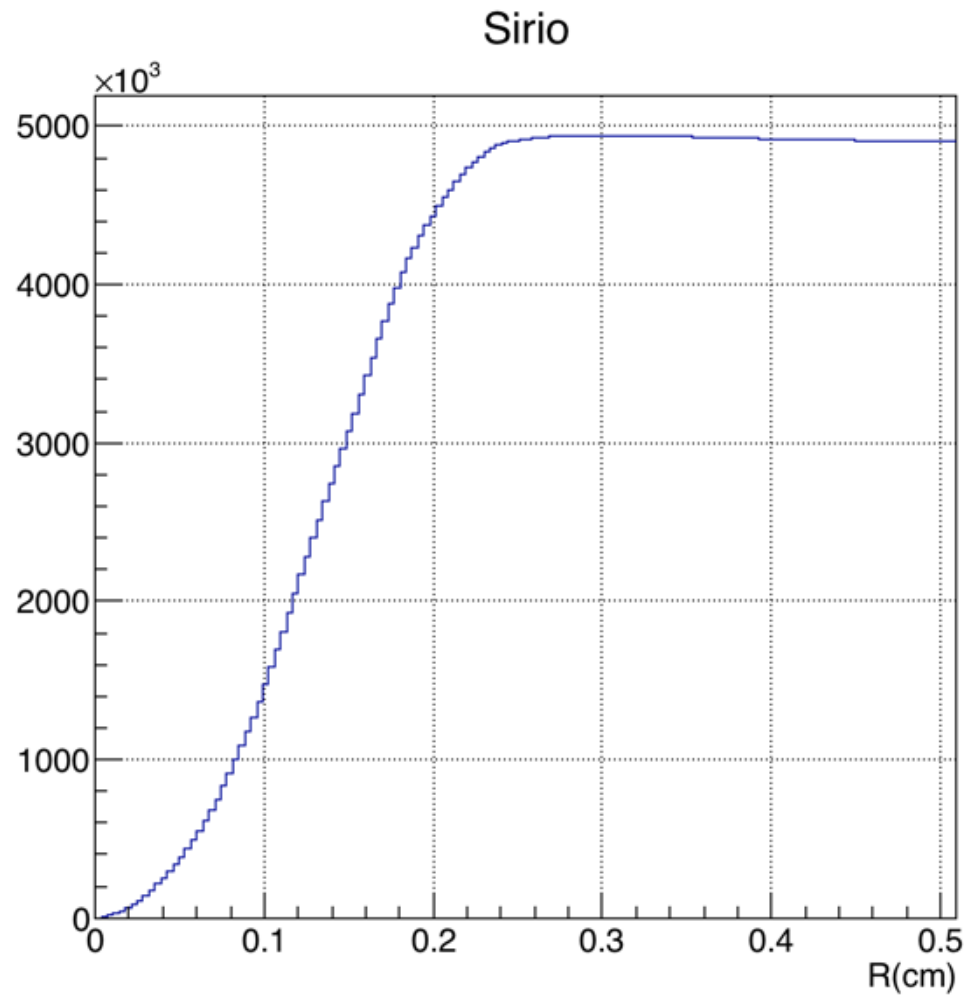
Oil well   Car   Lidar   Oil well

PSF of new Lidar optics

Last Malargue meeting we showed that the relative alignment between ancillary mirrors and central one is not changing with pointing direction.
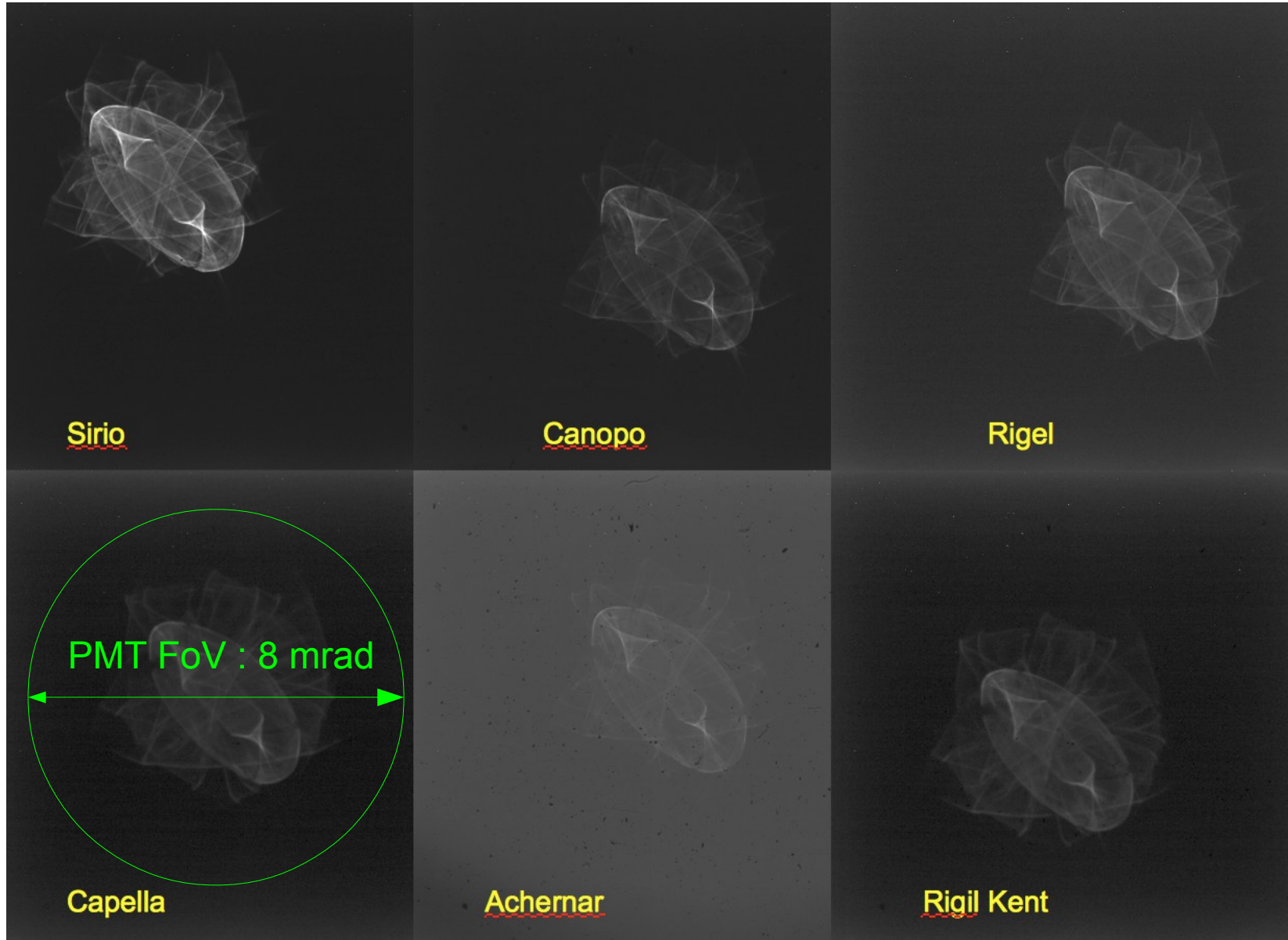
PSF of new Lidar optics

- spherical mirror
- composite mirror: 1 central+4 side units
- one known defect: astigmatism
- well reproduced in simulations

Remote Control of New (and old) Lidars

May 2015:
- Installed Licel + PMT
- Installed RPC (for remote control of all switches)
- Installed UPS
- Cabled FD Trigger (from LA-1) to allow simultaneous operation of the two lidars.
- installed Pelco webcam

June 2015:
- Torino Remote ControlRoom Is finally ready to operate

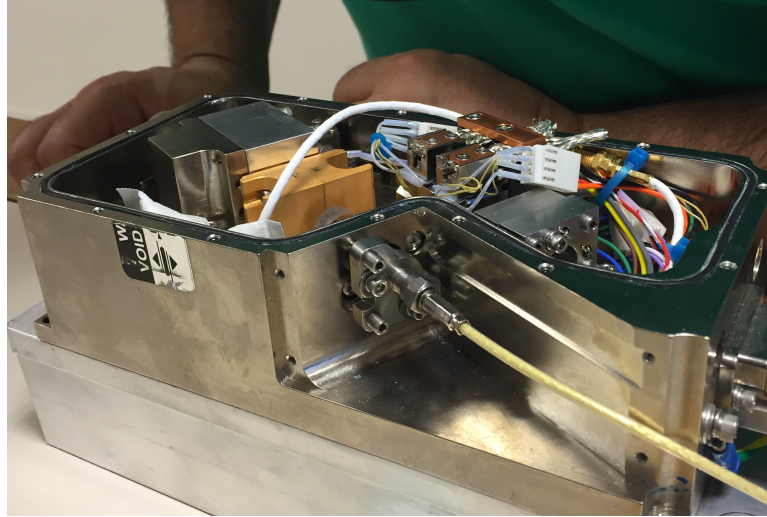What's left to do?

FIX THE OLD LASERS

Maintenance of Old Lidars

April 2015:
- Trip to Bariloche , to learn how to do laser maintenance from CNEA expert E.Cortizo.

- We used both IR viewer and IR sensitive paper, to ubicate the beam and to adjust the input fiber direction
- More work needed to fix the other lasers : a maintenance room is being prepared in Malargue.

E.Cortizo fixed the laser head 07-194 that will be installed in Loma Amarilla new Lidar in September-October

Richieste in Sezione

Avro' bisogno di ~2 mu di M.Mucchi e del mitico Simonetti per installare il Laser sul nuovo Lidar di Loma Amarilla e allinearlo , sperabilmente entro fine 2016.
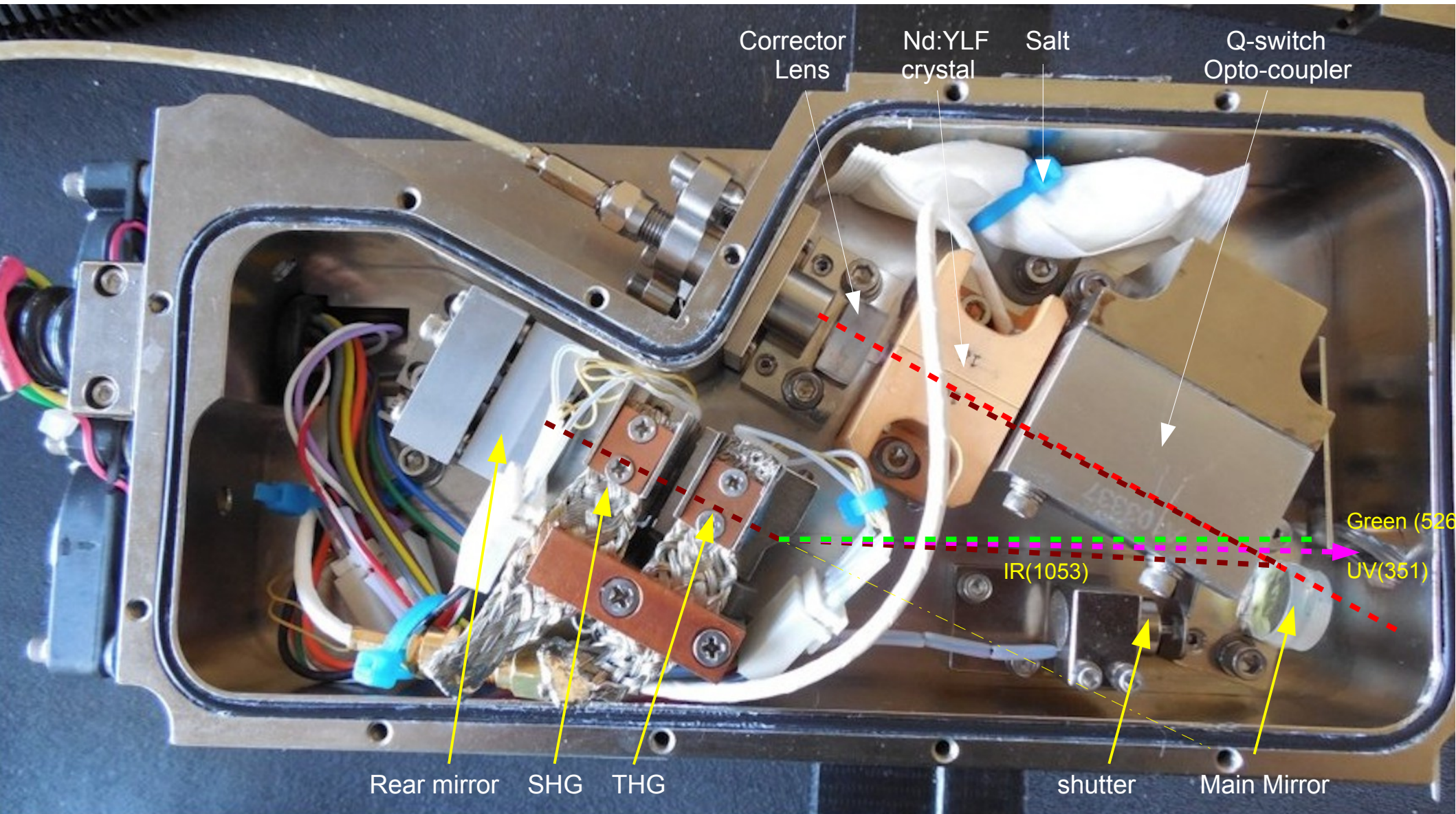Nel 2017 avro' bisogno di Mucchi per la manutenzione degli altri lidar.

DOMANDA DI UTILIZZO DEI SERVIZI DI BASE

Data della richiesta:

Lab. Tecnologico	✔	Lab. Elettronica		Centro di Calcolo		nuova richiesta	
						richiesta di continuazione	✔

Esperimento: AUGER

Responsabile locale A.Castellina
Responsabile dell'attivita' R.Mussa

Descrizione dettagliata dell'attivita' richiesta
Lidar 1000

PLANNING													MILESTONES	
Subattivita'	G	F	M	A	M	G	L	A	S	O	N	D	Data-mese	Descrizione
	✔	✔											2-3/2017	Commissioning Lidar 1000

Tecnici e tecnologi attualmente assegnati all'attivita'					Richieste di supporto tecnico per		
INFN		ALTRI ENTI			l'anno:		
Nome	mesi/U	Ente	Nome	mesi/U	Tipologia	N.	mesi/U
M.Mucchi	2				Tecnici mecc. /elettr/CdC	1	2
					Disegnatori meccanici		
					Microsaldatori		
					Tecnologi progett. mecc.		
					Tecnologi elettronici/CdC		
					Tecnologi microelettronica		

Note:

Photonics 07-194 Laser Head,
(fixed by Eduardo Cortizo in Bariloche, by adjusting the Rear mirror)

LIDAR upgrade

Looks closer
(0.8 km to 0.2 km)

Short range options   Long range options

— "D = 0 mm" — D = 500 mm — "D = 1000 mm" — "D = 1500 mm"

Full ray tracing simulation by Miroslav Pech includes shadows due to the PMT holder and the frame top (ZEMAX+MATLAB)

Overlap function vs Distance (m)

Looks farther
(30 km to > 35 km)

* 10x dynamic range
* 1/3 field of view
* 1/10 star background
* less forgiving on misalignments

D = 1000 mm

D = 1500 mm

PC upper threshold

PC lower threshold

Sky background

Signal (MHz) vs Distance (m)