Accelerator Division Activities

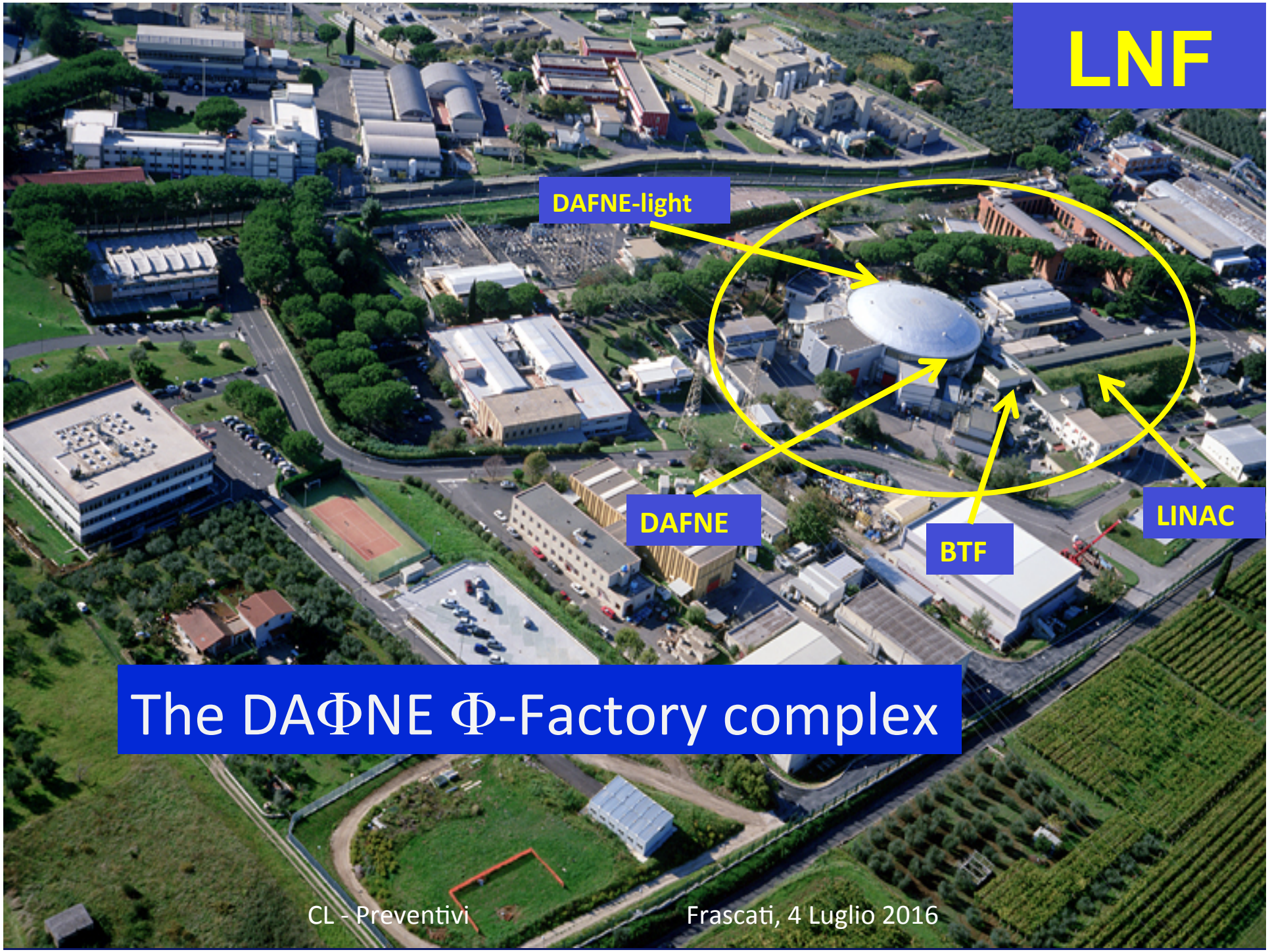
Andrea Ghigo on behalf of
INFN-LNF Accelerator Division

CL - Preventivi

Frascati, 4 Luglio 2016

Accelerator Division Main Projects

- DAΦNE
- SPARC-LAB
  - FEL
  - Plasma acceleration
  - Thomson Scattering
  - FLAME
  - TeraHertz
- Beam Test Facility
- ELI-NP (Romania) / STAR (Cosenza)
- Collaborations: LC/CLIC, HL-LHC, FCC, ESRF…



The DAΦNE Φ-Factory complex

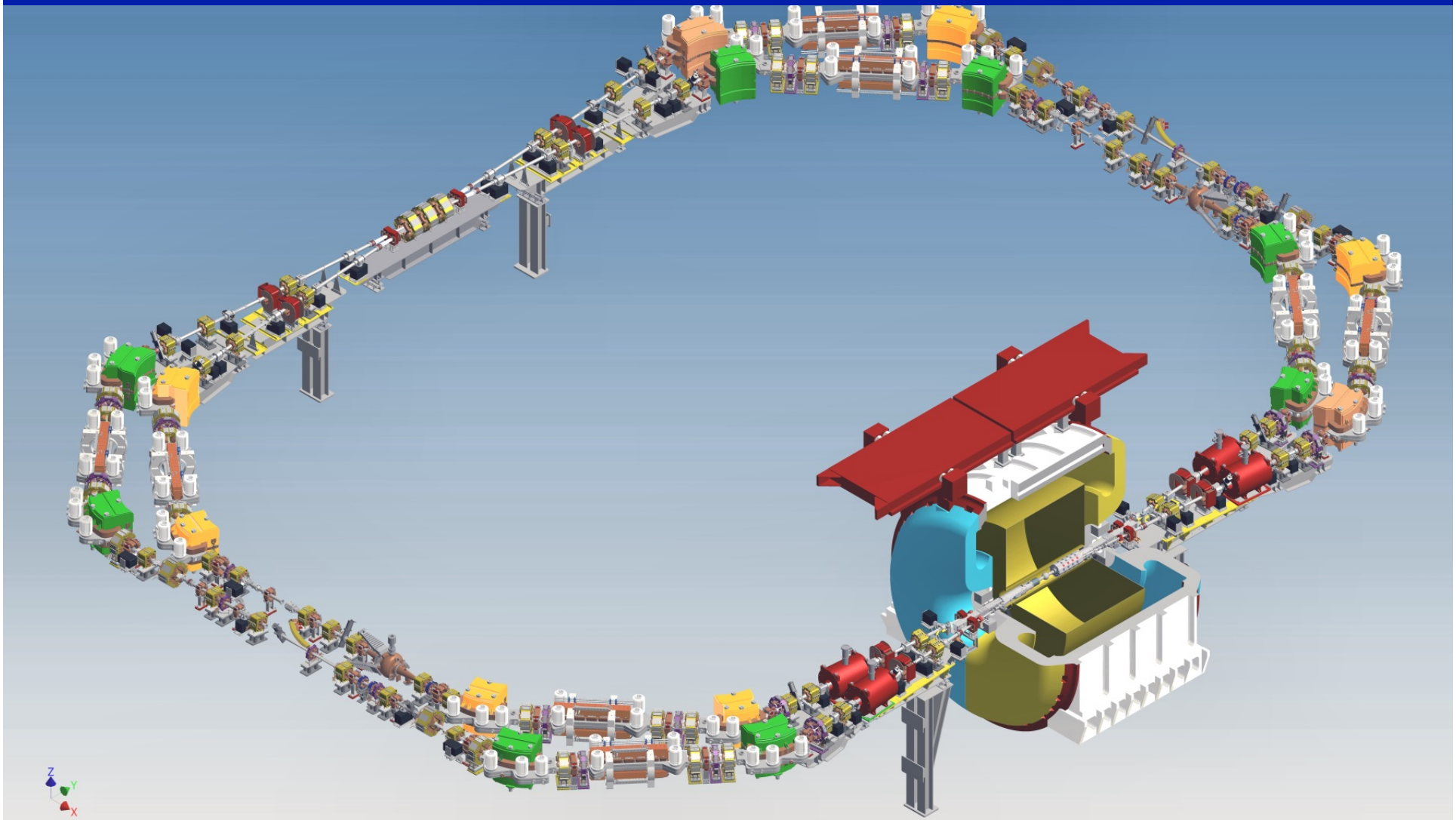
DAΦNE – LNF - FRASCATI

e+ e-

E_{cm} = 1.02 GeV

L = 2 x 10^{32} cm^{-2} sec^{-1}

DAΦNE e KLOE2



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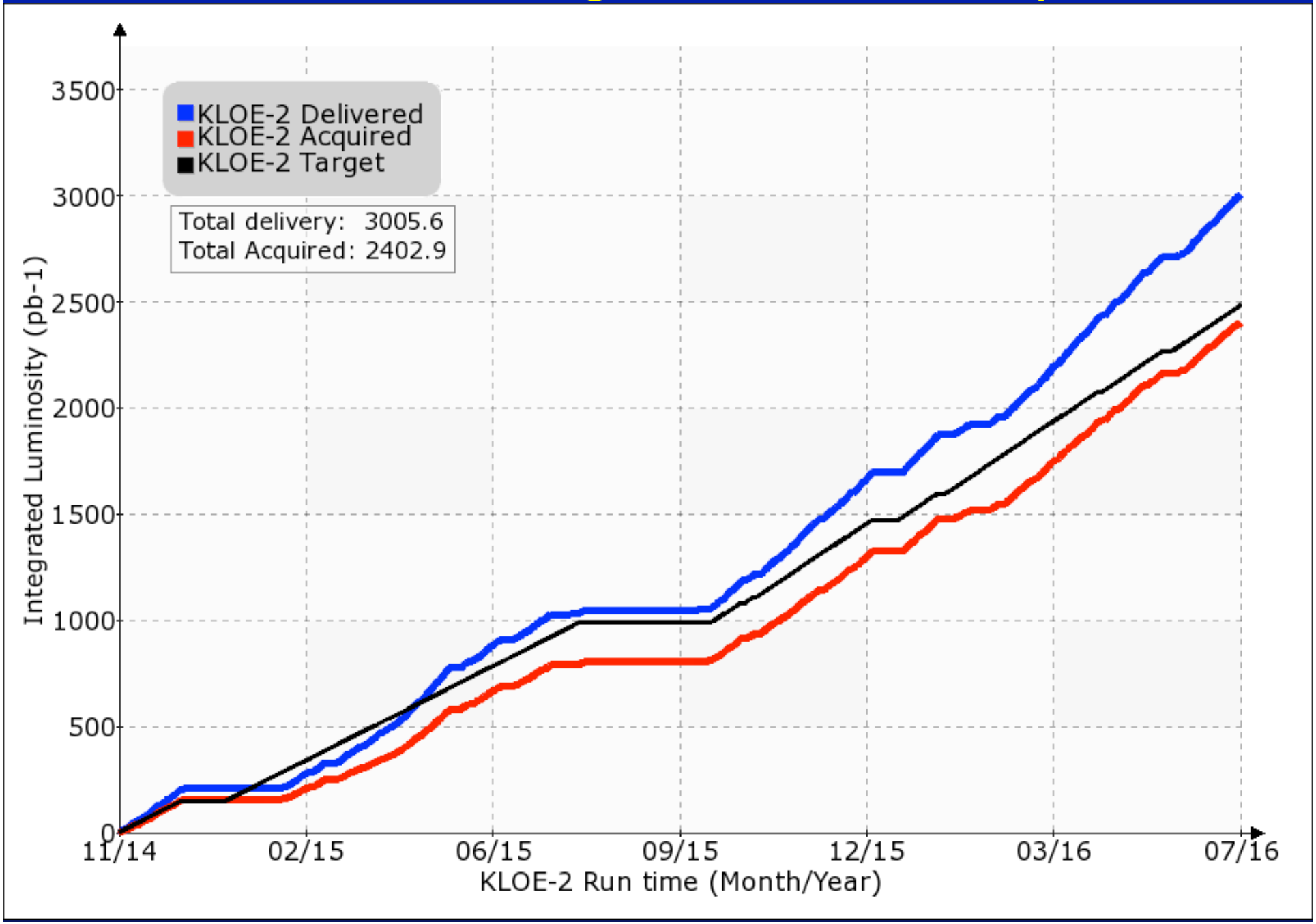
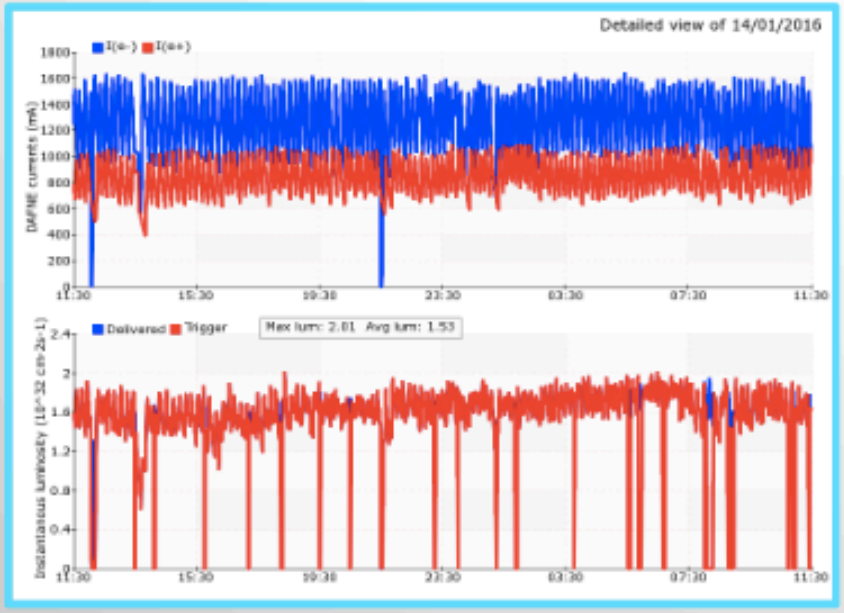
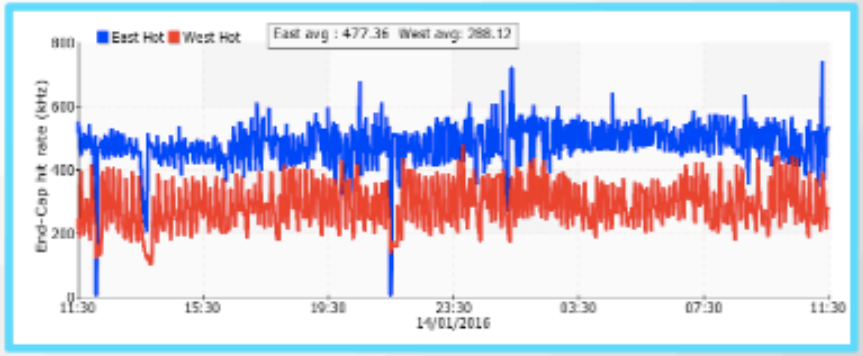
DAΦNE Integrated Luminosity

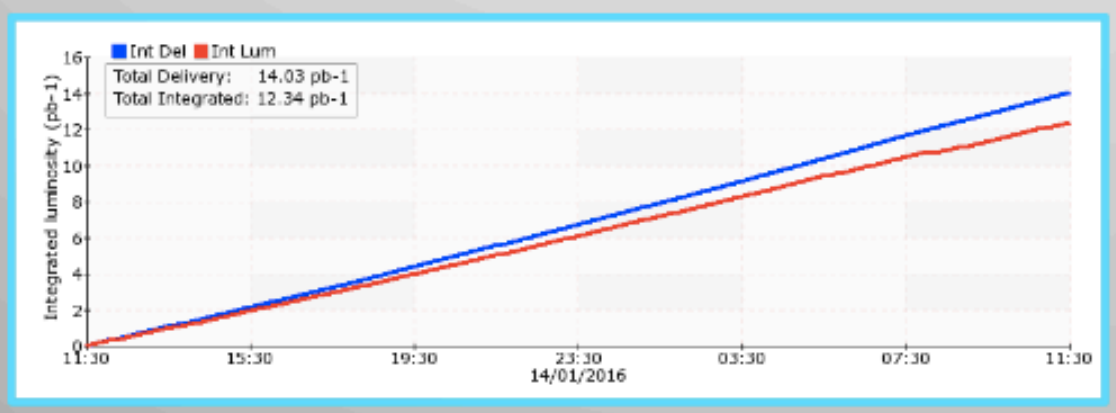


Best 24 Hours Integrated Luminosity





- 2 beam losses due to PS faults
- 105 bunches
- $I^-_{MAX} = 1.5 \div 1.6$ A
- $I^+_{MAX} = 1.0 \div 1.16$ A
- Sustainable background

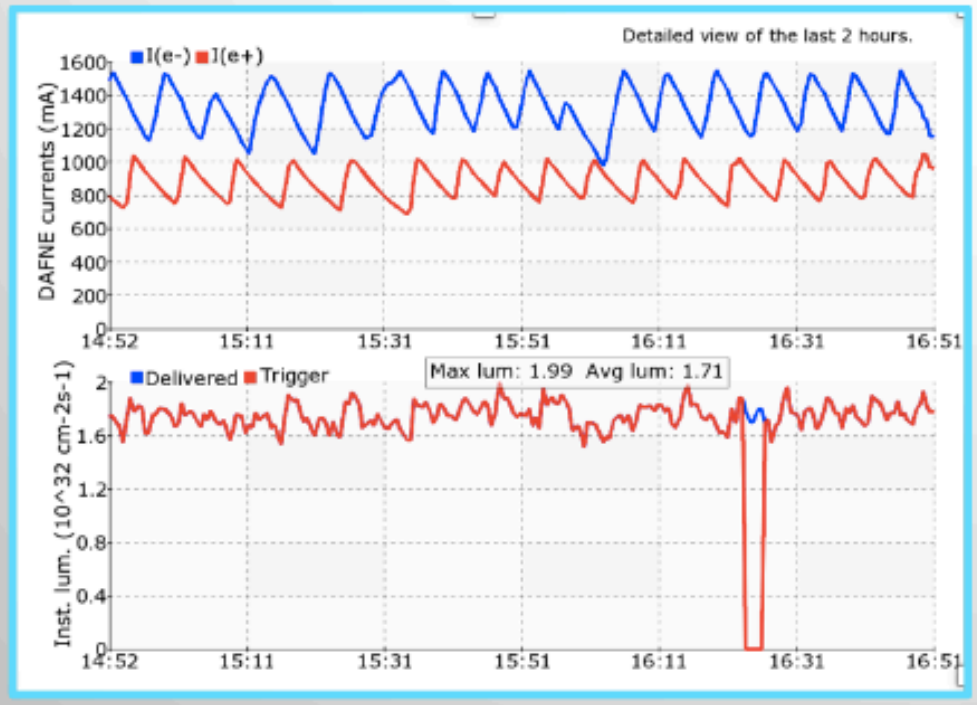


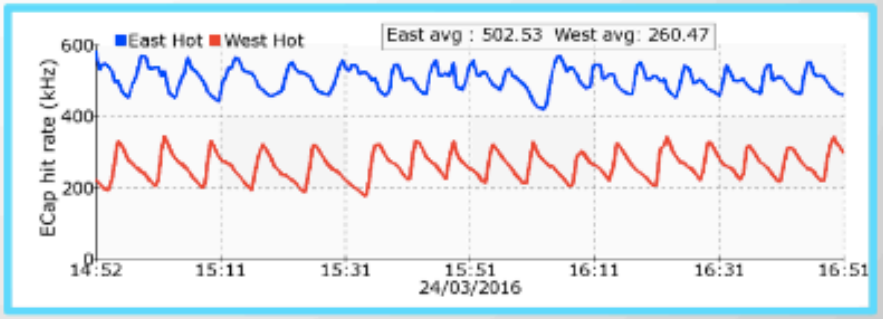
$\int_{del} L \sim 14.03\ pb^{-1}$

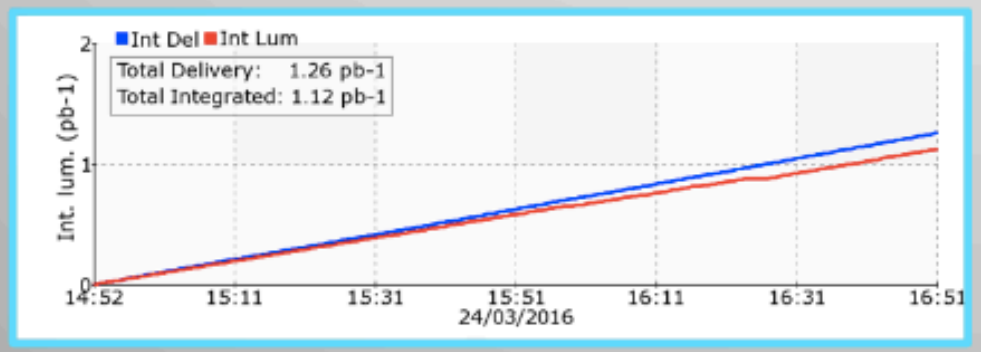
$\int_{acq} L \sim 12.34\ pb^{-1}$

Uptime ~98%

Best Hourly Integrated Luminosity



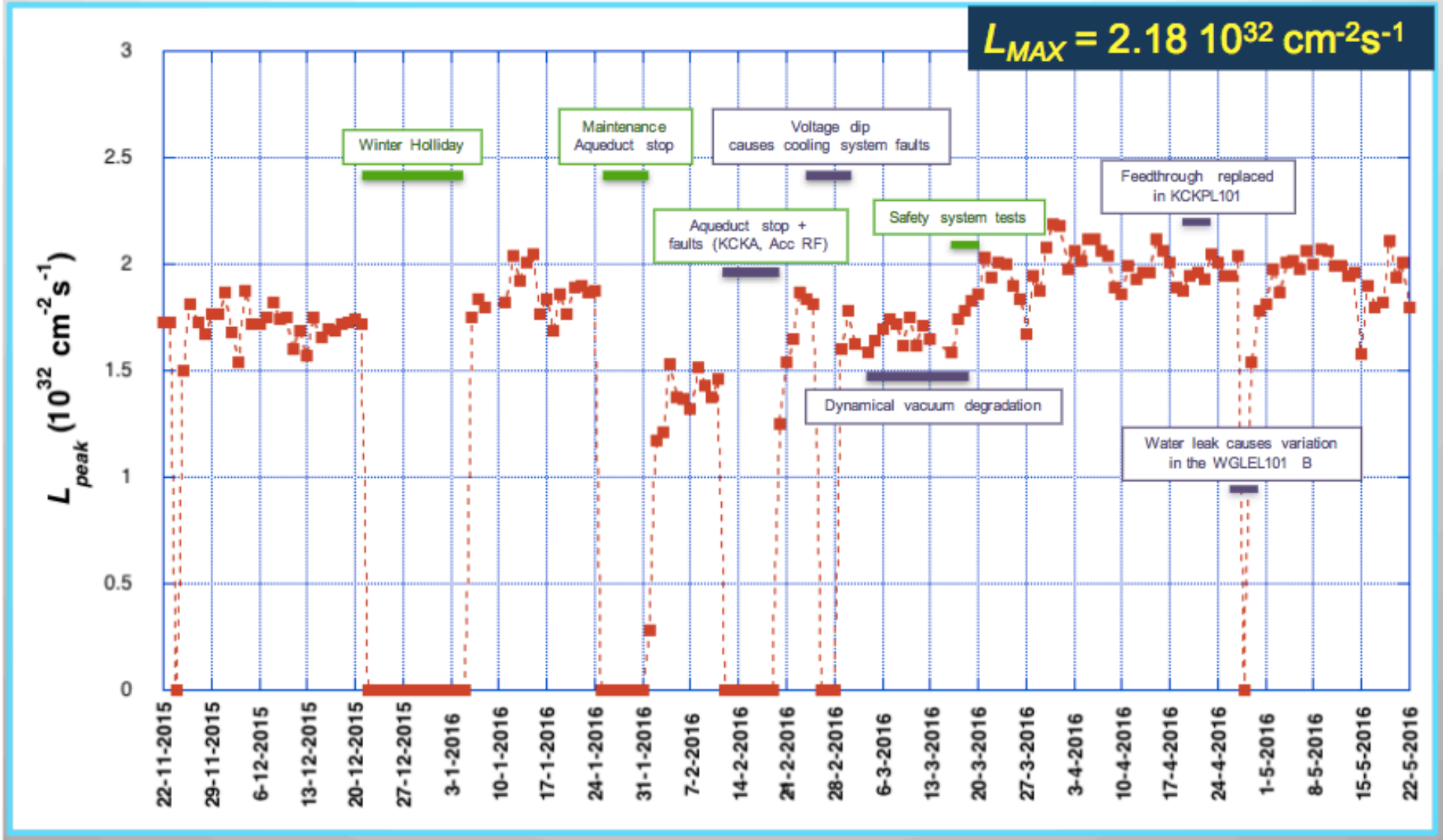




$L_{\int 1h} \sim 0.63\ pb^{-1}$

$L_{\int 1day} \sim 15.1\ pb^{-1}$

Peak Luminosity Trend



Summer shutdown activities

In addition to the ordinary maintenance program several major interventions have been planned on the DAFNE hardware

Cryogenic plant	→	New Compressor
Linac	→	New Linac gun pulser
Control System	→	Extraordinary maintenance (under definition)
Power Supplies	→	New Linux servers for the consoles

SIDDHARTA-2 study group

This group has the duty to evaluate the design effort and the resources necessary to undertake a new run of DAΦNE for the SIDDHARTA upgraded detector: SIDDHARTA-2

Relying on the assumptions:

- SIDDHARTA-2 installed in place of the KLOE-2 detector
- IR design as much as possible the same as the one implemented for the SIDDHARTA run

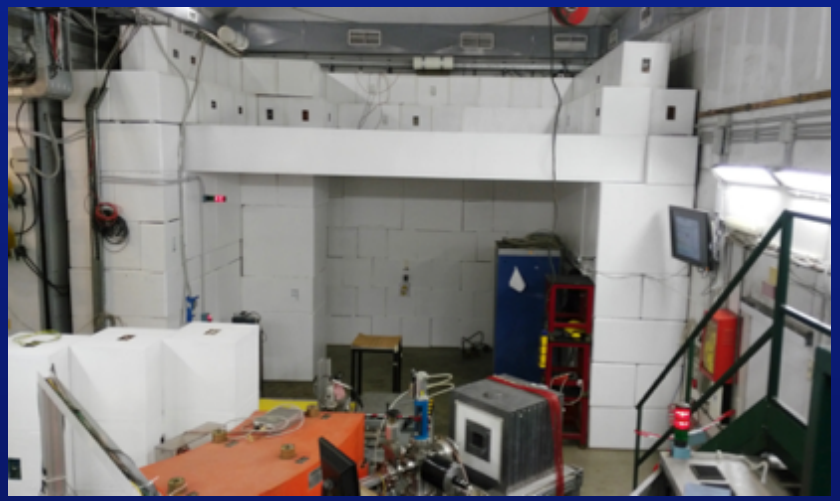
It's necessary to study and to define the following issues:

- KLOE-2 removal
- Inventory of the IR components used for the SIDDHARTA run
- Low-β permanent magnet quadrupoles
- IR diagnostics definition
- Study of the mechanical compatibility of the new detector setup with:
- IR layout
- background shielding
- collider diagnostics
- Possible main rings modification aimed at improving operation efficiency

Beam Test Facility

BEFORE

BTF New shielding and control room



AFTER

BTF 2016: first call

Not approved

Cancelled/Maintenance

January-July:

- 2 development shifts
- 1 safety qualification stop
- 1 maintenance week
- 1 CHAOS-BTF joint shift
- **18 users slots/22 requested**

Up to today:

- **140 users** (with double counting)

Jan

Feb

Mar

Apr

May

Jun

Jul

Start	End	User	Group Leader	Rollin/out (h)	beam (days)	dose	Min. Energy	Max. Energy	Particle	Min. Mult.	Max. Mult.	Info	Priority
2016-01-11	2016-01-25	BTF-CHAOS	Luca Foggetta	6	14	0.0	250.0	500.0	Electron	1.0	1000.0	Upgrade to CHAOS of BTF control system	Main user
2016-01-25	2016-02-01	BTFstaff	Paolo Valente	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	Plant maintenance	Main user
2016-02-01	2016-02-08	INSUB	Michela Prest	6	7	0.0	100.0	500.0	Electron	1.0	100.0	In collaborazione con l'Università dell'Insubria *RECUPERO*	Main user
2016-02-08	2016-02-15	ITS	Paolo Martinengo	6	7	0.0	500.0	500.0	Electron	1.0	1000.0		Main user
2016-02-15	2016-02-22	tof_diamonds	Roberto Cardarelli	6	7	0.0	500.0	750.0	Electron	1.0	1000.0		Main user
2016-02-22	2016-02-29	BTFstaff	Paolo Valente	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	BTF staff measurements	Main user
2016-02-29	2016-03-07	GMINUS2	Antonio Anastasi	6	7	0.0	300.0	500.0	Electron	1.0	1000.0		Main user
2016-03-01	2016-03-08	PADME	Mauro Raggi	6	7	0.0	100.0	600.0	Positron	1.0	1.e+4	Test of the PADME Ecal and target	Main user
2016-03-07	2016-03-14	MIMOSA	Spiriti Eleuterio	6	7	0.0	500.0	500.0	Electron	1.0	1.e+4	Si propone una misura di caratterizzazione del Timepix3 per applicazione in PADME cercando di risolvere la struttura temporale del bunch della BTF fino a 10e4 elettroni per bunch.	Main user
2016-03-07	2016-03-14	VIRHIS	Massimo Zambelli	6	7	0.0	27.0	27.0	Electron	1.0	1000.0		Main user
2016-03-14	2016-03-21	NRTI/NRCA	Antonino Pietropaolo	8	7	0.0	500.0	500.0	Electron	1.0	1000.0		Main user
2016-03-21	2016-03-28	BTFstaff	Paolo Valente	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	BTF staff measurements at high intensity	Main user
2016-03-28	2016-04-04	CRYSBEAM	G.Cavoto	6	7	0.0	500.0	500.0	Electron	1.0	1.e+4	Diamond with Medipix readout	Main user
2016-04-04	2016-04-11	PADME	Mauro Raggi	6	7	0.0	100.0	600.0	Positron	1.0	1.e+4	Test of the PADME Ecal and target	Main user
2016-04-11	2016-04-18	MIMOSA	Spiriti Eleuterio	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	Test rivelatori a pixel monolitici per ALICE	Main user
2016-04-11	2016-04-18	NITEC	Elisabetta Baracchini	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	We are going to test the response, calibrate and characterize a small prototype TPC with 5 cm drift distance equipped with GEMPix readout with different gas mixtures at various pressure below 1 atm, both in conventional electron-carrier configuration and	Main user
2016-04-18	2016-04-25	BTFstaff	Paolo Valente	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	Safety qualification	Main user
2016-04-25	2016-05-02	LIMADOU	BRUNO SPATARO	8	7	10.0	25.0	120.0	Electron	1.0	1000.0	Dimensions of the HEPD calorimeter: 55 cm x 40 cm x 40 cm	Main user
2016-05-02	2016-05-09	mambo	Roberto Messi	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	test per il rivelatore MPRC	Main user
2016-05-09	2016-05-16	MONDO	Michela Marafini	25	7	0.0	50.0	500.0	Electron	1.0	100.0		Main user
2016-05-09	2016-05-16	VIRHIS	Massimo Zambelli	6	7	0.0	27.0	27.0	Electron	1.0	1000.0		Main user
2016-05-16	2016-05-23	3D-SOD	Leonello Servoli	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	Test of Silicon-On-Diamond devices.	Main user
2016-05-23	2016-05-30	BTFstaff	Paolo Valente	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	Maintenance	Main user
2016-05-30	2016-06-06	IMCP	Paolo Meridiani	6	7	50.0	500.0	500.0	Electron	1.0	100.0		Main user
2016-06-06	2016-06-13	FIRB_CluCount	Francesco Renga	6	7	50.0	500.0	500.0	Electron	1.0	1000.0		Main user
2016-06-13	2016-06-20	BTFstaff	Paolo Valente	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	Reserved	Main user
2016-06-20	2016-06-27	SIDDHARTA/AMADEU	Catalina Petrascu	6	7	0.0	500.0	500.0	Electron	1.0	1000.0		Main user
2016-06-27	2016-07-11	PADME	Mauro Raggi	6	14	0.0	100.0	600.0	Positron	1.0	1000.0	Test of the PADME target and ECAL	Main user
2016-07-04	2016-07-11	MU2E	Ivano Sarra	6	7	0.0	60.0	140.0	Electron	1.0	2.0	We need good beam energy spread at 100 MeV ***CANCELLED, to be rescheduled***	Main user
2016-07-11	2016-07-16	BTFstaff	Paolo Valente	6	5	0.0	500.0	500.0	Electron	1.0	1000.0	Reserved for BTF	Main user
2016-07-17	2016-09-11	BTFstaff	Paolo Valente	6	56	0.0	500.0	500.0	Electron	1.0	1000.0	Summer shutdown	Main user

BTF 2016: second call

September-December:

- 2 pre-booked shifts (startup, teacher's week)
- 1 safety qualification week
- 1 development shift
- **16 weeks new requests**

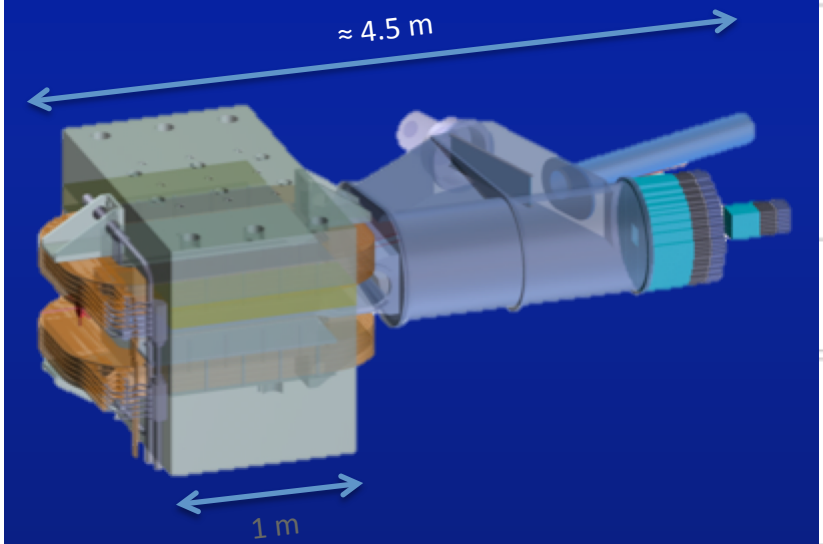
Considering already booked or not available weeks, we will accept not more than **8 out of 20** new requests for the last part of the year

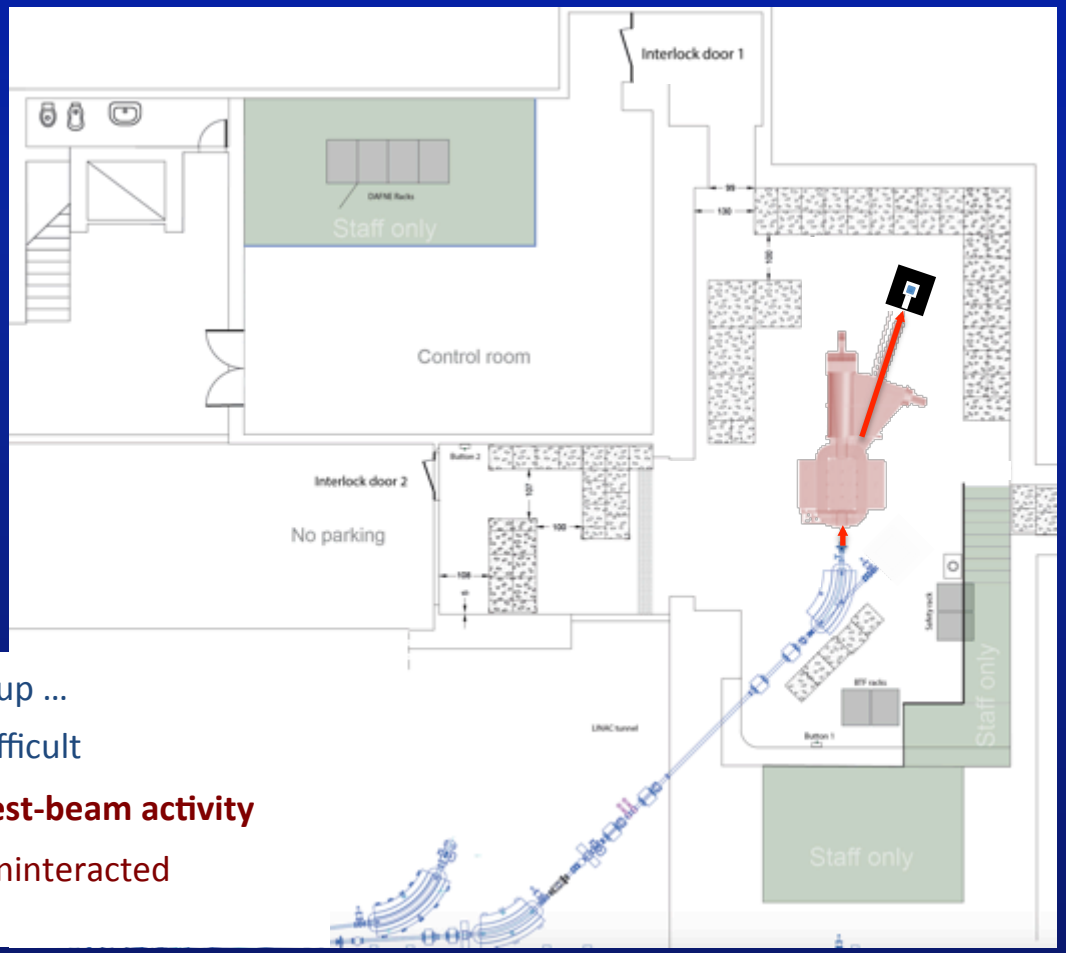
Start	End	User	Group Leader	Rollin/out (h)	beam (days)	dose	Min. Energy	Max. Energy	Particle	Min. Mult.	Max. Mult.	Info	Priority
2016-09-06	2016-09-13	CALOCUBE	Oscar Adriani	6	7	999.9	200.0	500.0	Electron	1.0	1000.0	CALOCUBE can work also with positron in case of necessity We can perform our beam test also with different start period.	Main user
2016-09-09	2016-09-16	3D-SOD	Leonello Servoli	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	test of 3D diamond detectors.	Main user
2016-09-12	2016-09-19	BTFstaff	Paolo Valente	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	Restart BTF and test	Main user
2016-10-01	2016-10-15	PADME	Mauro Raggi	6	14	0.0	100.0	500.0	Positron	1.0	1.e+4	Test of the PAMDE Ecal target and Vetos	Main user
2016-10-02	2016-10-09	OptoTracker	Andrea Celentano	6	7	0.0	500.0	500.0	Electron	1.0	1.0		Main user
2016-10-03	2016-10-10	CRYSBEAM	G.Cavoto	6	7	0.0	500.0	500.0	Electron	1.0	1.e+4	Test and calibration of new Cherenkov radiators	Main user
2016-10-03	2016-10-10	IDF	Paolo Valente	6	7	0.0	100.0	500.0	Electron	100.0	1000.0	Incontri di Fisica	Main user
2016-10-03	2016-10-10	DCaNT	G.Cavoto	6	7	0.0	100.0	500.0	Electron	100.0	1000.0		Main user
2016-10-09	2016-10-16	MU2E	Ivano Sarra	6	7	0.0	60.0	140.0	Electron	1.0	2.0	We need good beam energy spread at 100 MeV	Main user
2016-10-10	2016-10-17	QWLS	Pasquale Lubrano	6	7	0.0	500.0	500.0	Electron	1.0	1000.0		Main user
2016-10-10	2016-10-17	JLAB12-Rome	Guido Maria Urciuoli	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	The beam is requested to test silicon microstrip detectors to be installed as front part of the tracker of the SBS spectrometer to be installed in the experimental Hall A of JLab in Newport News, Virginia USA.	Main user
2016-10-30	2016-11-06	CESR-dark	Jim Alexander	6	7	0.0	500.0	500.0	Electron	1.0	1000.0		Main user
2016-11-14	2016-11-21	NITEC	Elisabetta Baracchini	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	We are going to test the response, calibrate and characterize a full length TPC with 20 cm drift length equipped with GEMPix readout with different gas mixtures at various pressure below 1 atm, both in conventional electron-carrier configuration and ne	Main user
2016-11-28	2016-12-05	FIRB_CluCount	Francesco Renga	6	7	50.0	500.0	500.0	Electron	1.0	1000.0		Main user
2016-11-28	2016-12-05	MIMOSA	Spiriti Eleuterio	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	Test of a Plume ladder (about 12x2cm square double plane pixel tracker) and a Pegasus (pixel sensor for spectrometer application) prototype. For application in Hadrontherapy fragmentation measurements.	Main user
2016-12-12	2016-12-19	DCaNT	G.Cavoto	6	7	0.0	100.0	500.0	Electron	100.0	1000.0		Main user
2016-12-12	2016-12-19	ITS	Paolo Martinengo	1	7	0.0	500.0	500.0	Electron	1.0	1000.0		Main user

- **Projected overall 2016: 38 requests/26 delivered** [updated at today]
- **≈240 beam-days**
- **In line with usual 150% request/delivered ratio**

Second beam-line: PADME setup

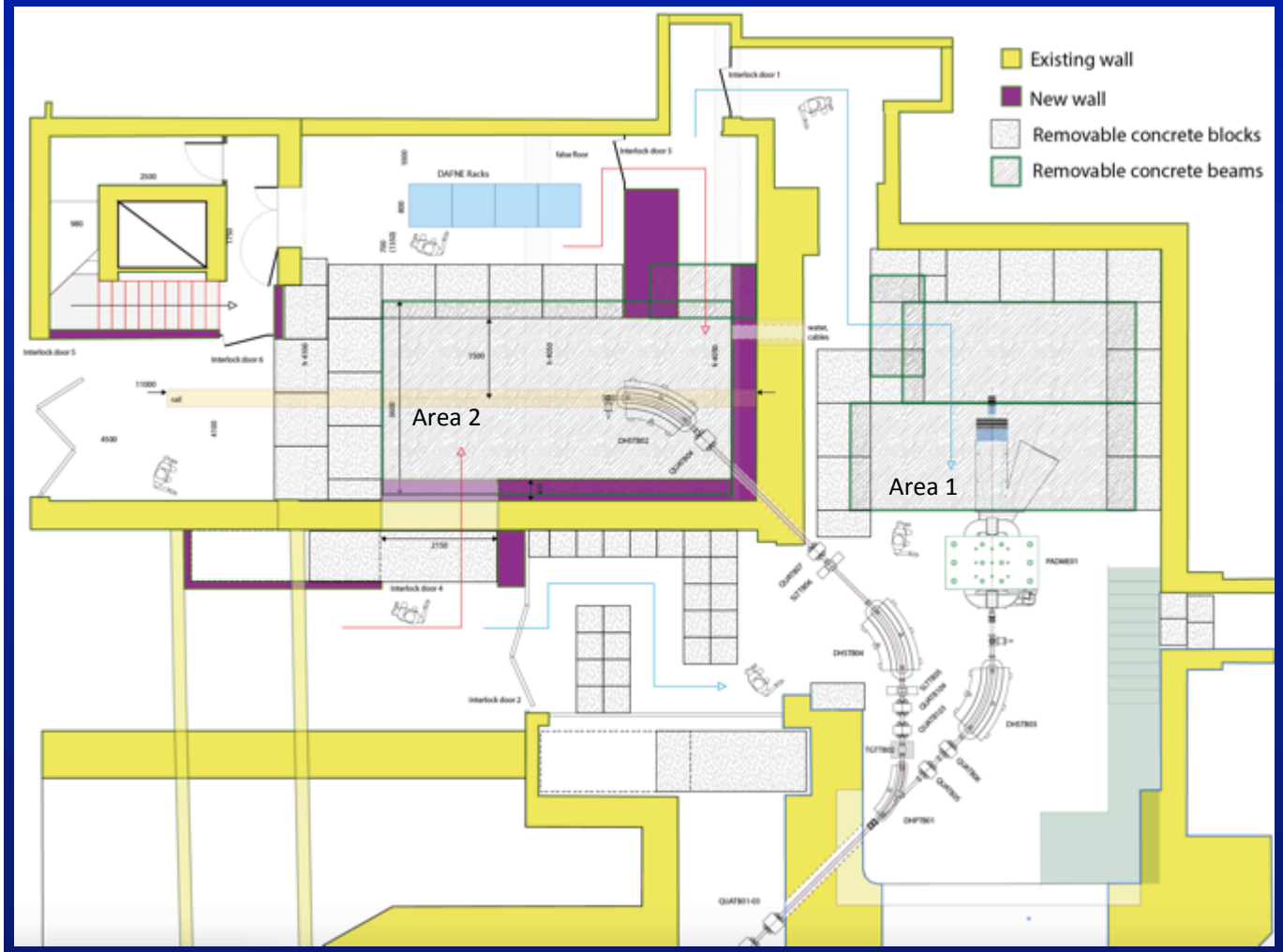
Latest **PADME** experiment layout:





- The present BTF layout **can host** the PADME setup …
- … but this would make **any other installation** difficult
- A long PADME run, however, will **prevent any test-beam activity**
- A **small dump** for minimizing back-splashes of uninteracted positrons **is required**

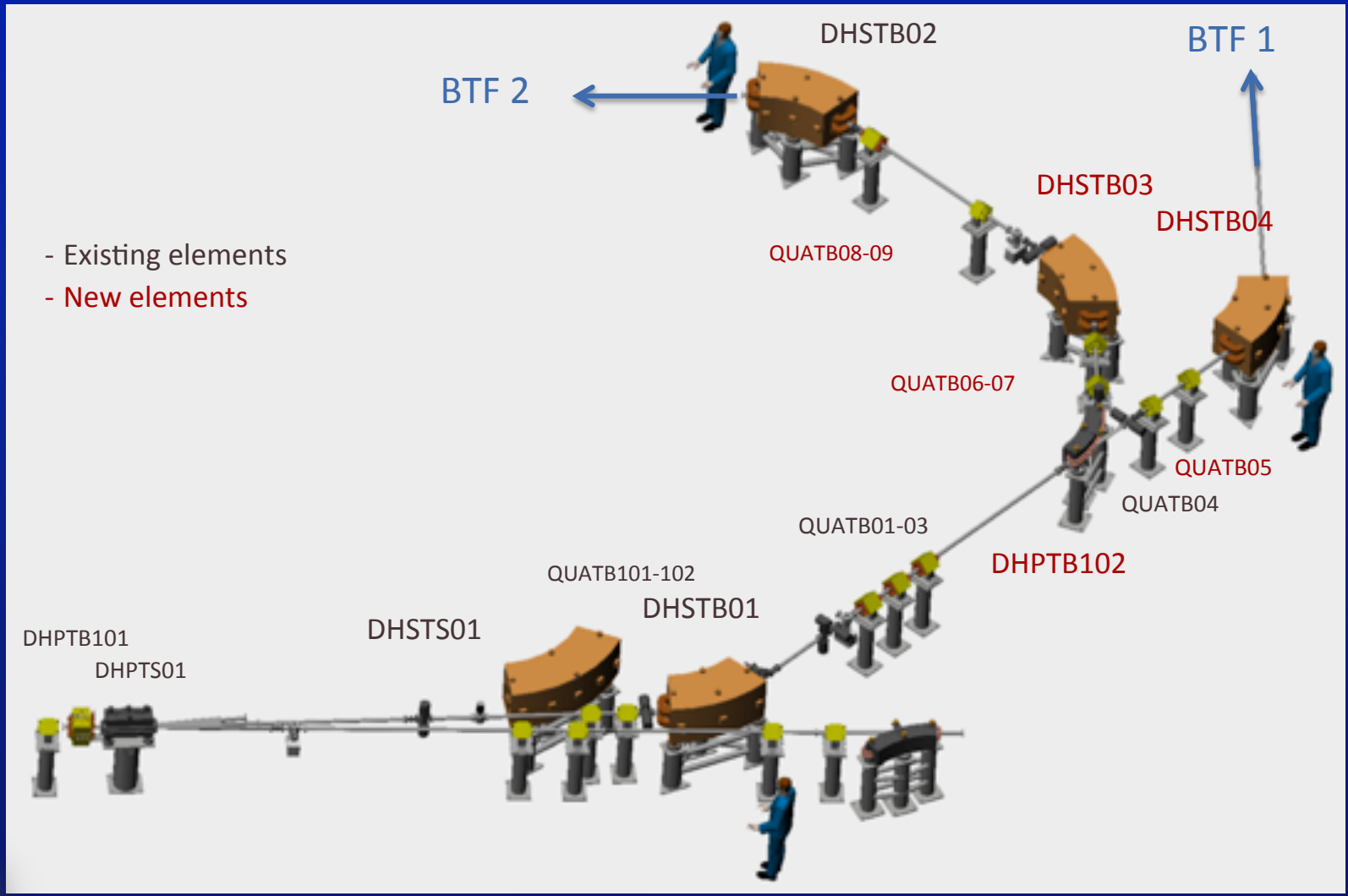
Second beam-line layout



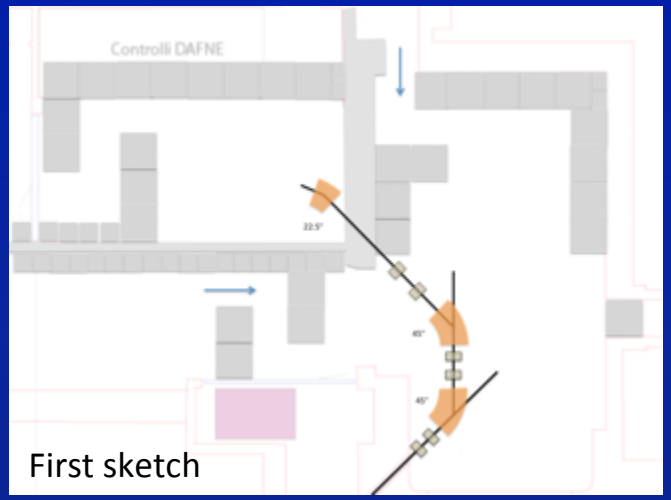
Very little or no impact on DAFNE operations:

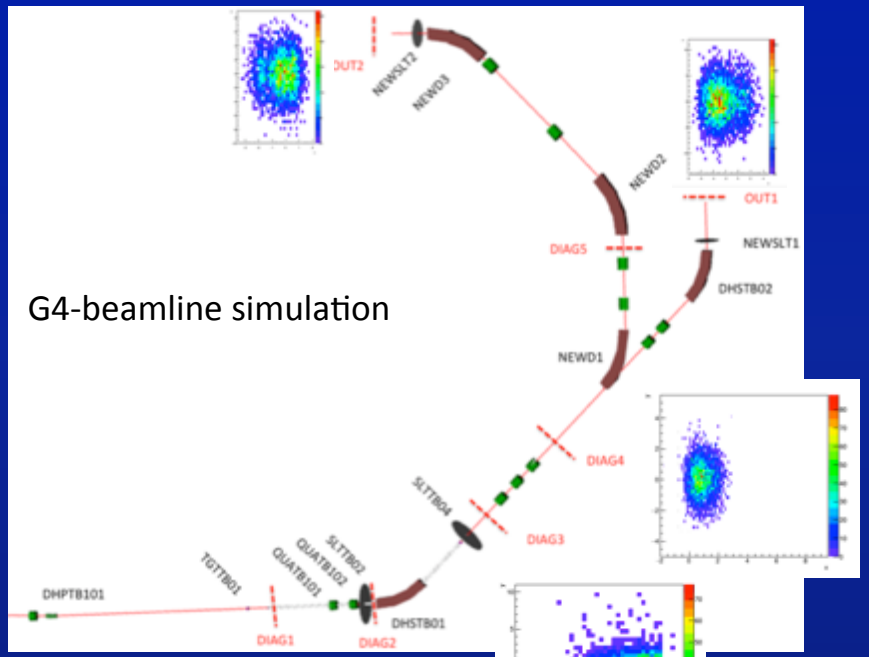
- DAFNE damping ring and timing racks stay untouched ???
- Minimal intervention in LINAC tunnel

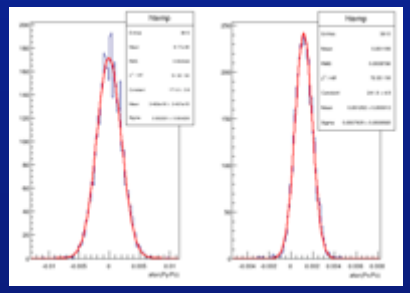
Second beam-line: layout

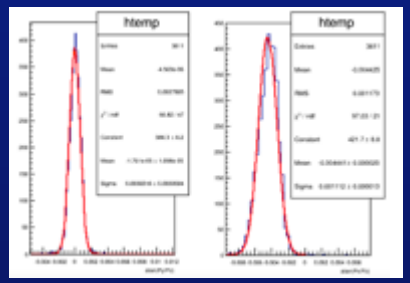


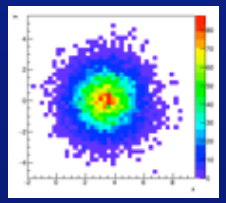
Second line: from idea to optics

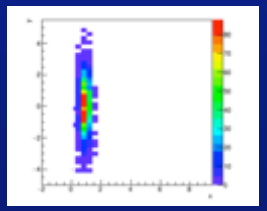


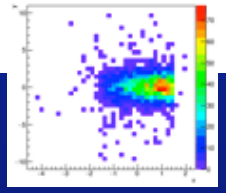


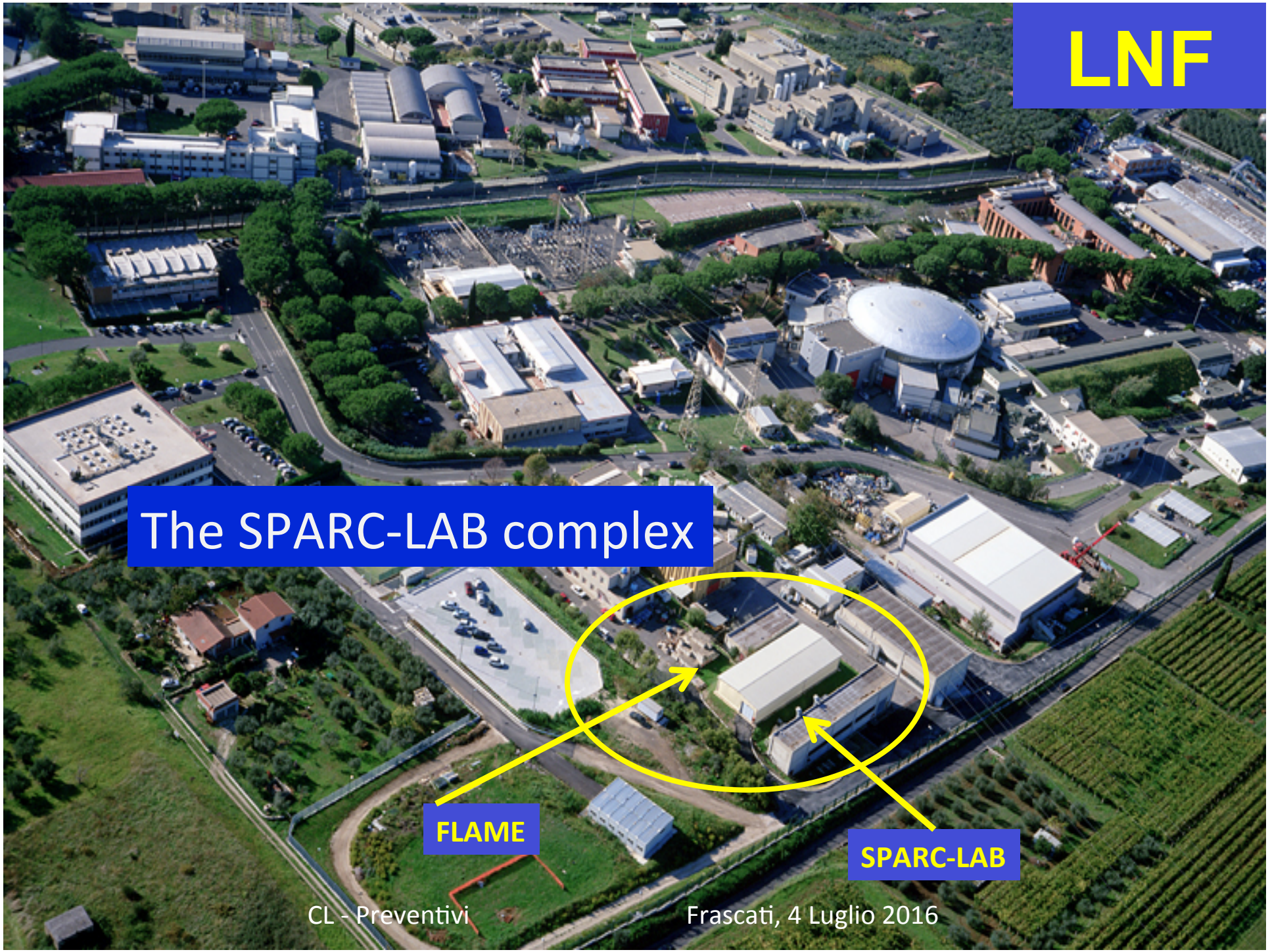






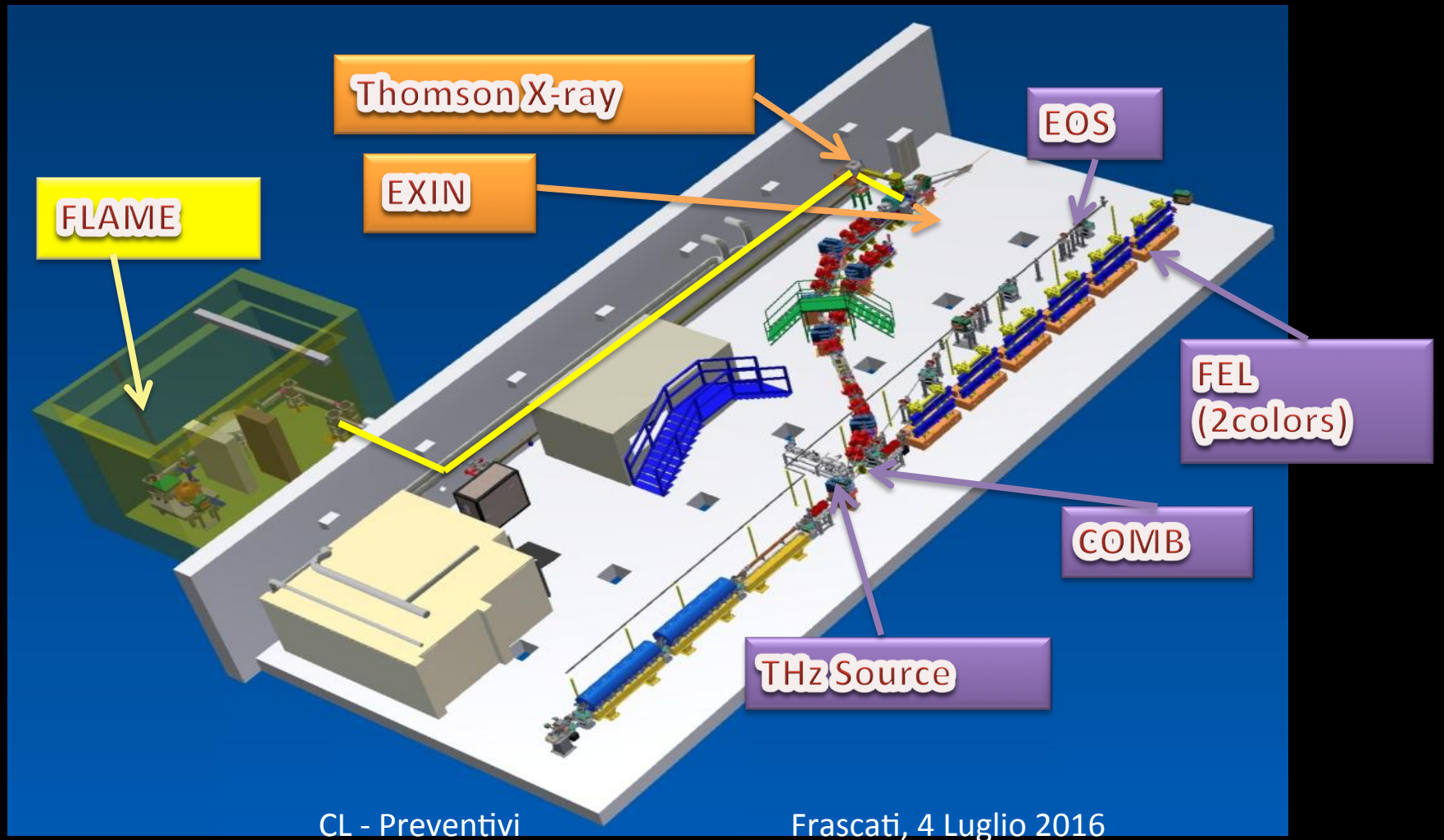





LNF
The SPARC-LAB complex
FLAME
SPARC-LAB

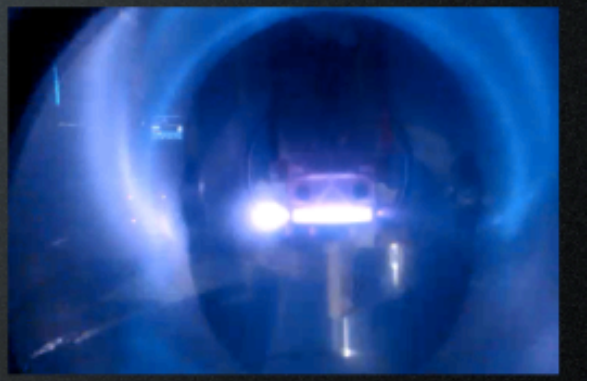
SPARC_LAB

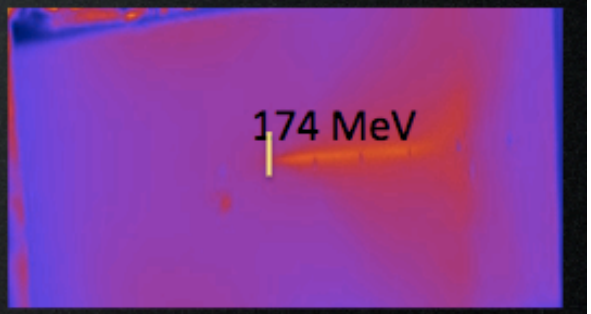
Sources for Plasma Accelerators and Radiation Compton with Lasers And Beams

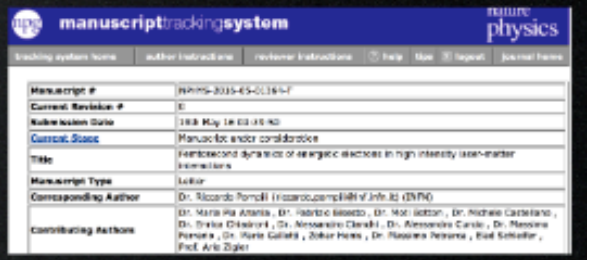


Highlights

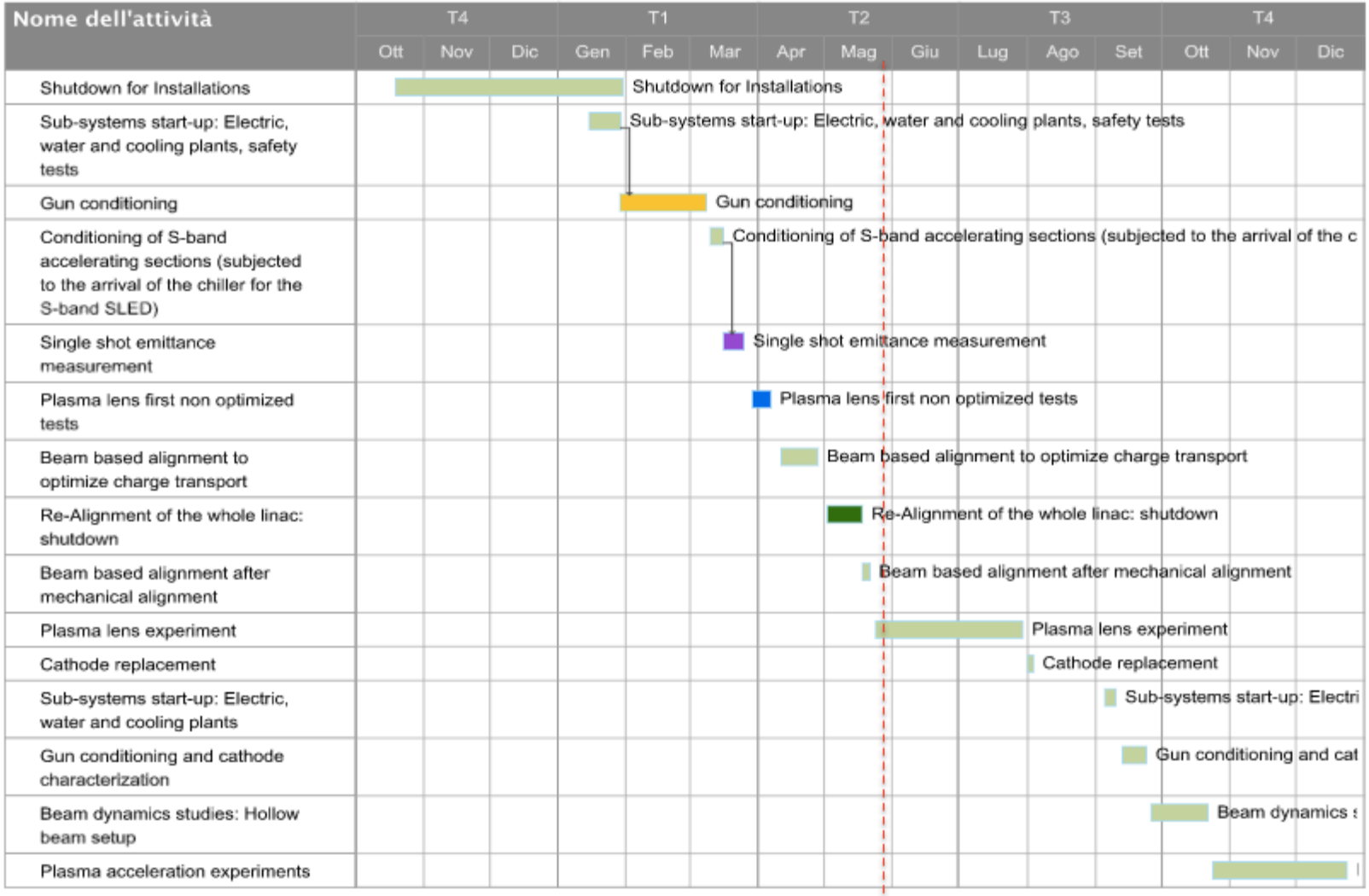
- THz: results published Nature Communications
- PWFA: first beam injected in to the plasma
- LWFA: self-injected beam accelerated up to 170 MeV, betatron radiation detected, emittance measurments in progress
- TNSA: results submitted to Nature Physics



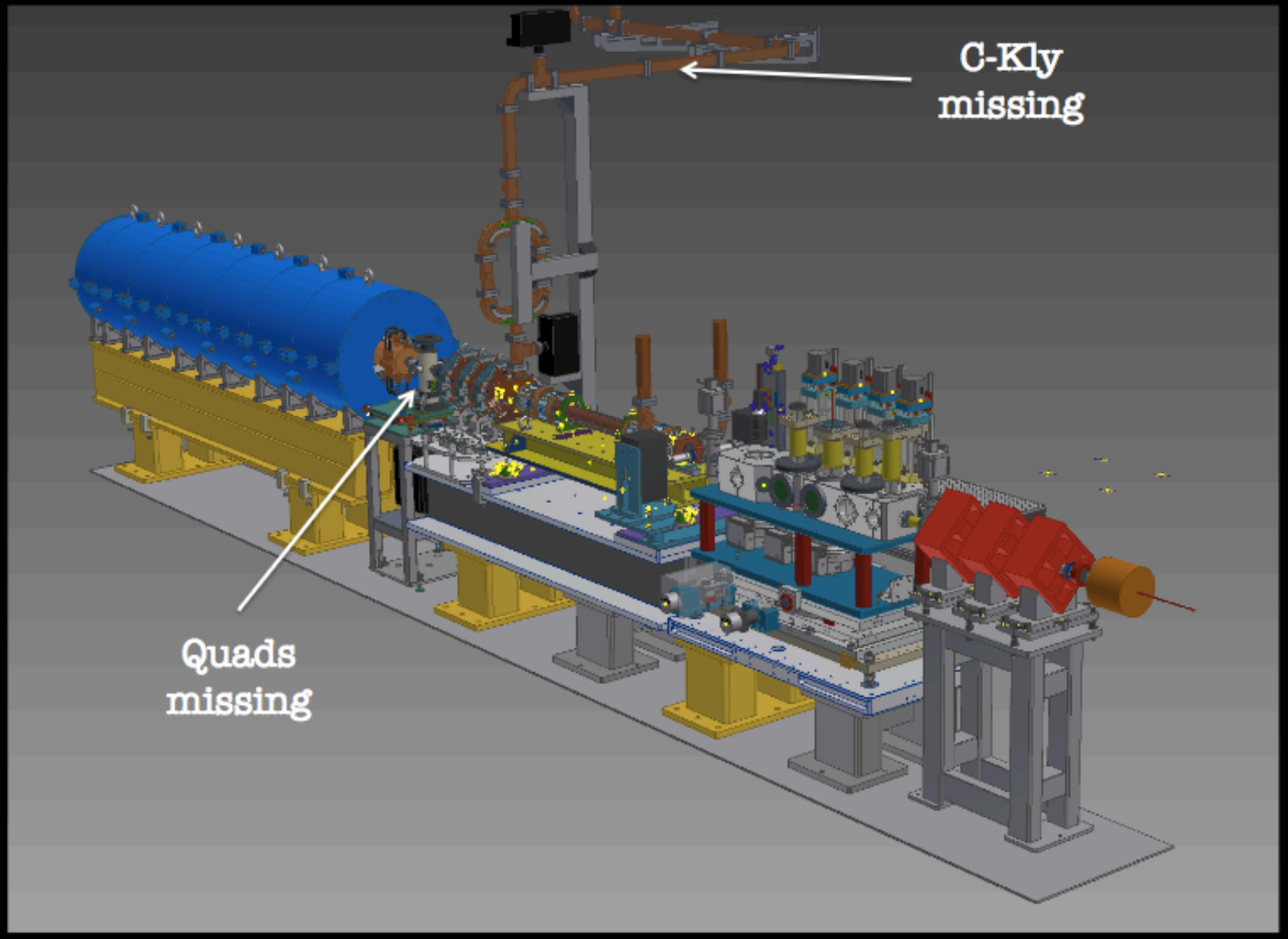




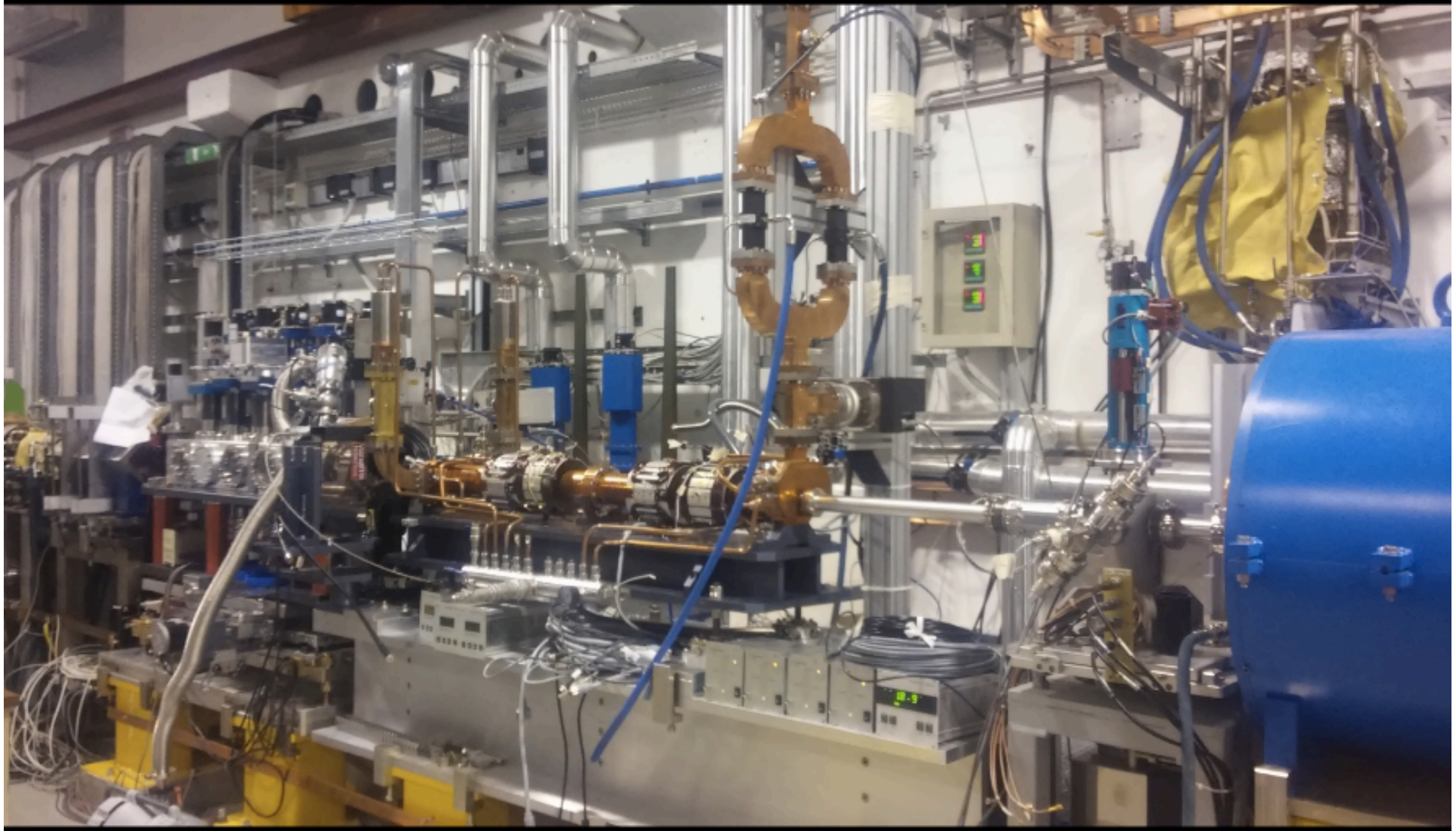
15 October 2015 – 23 December 2016



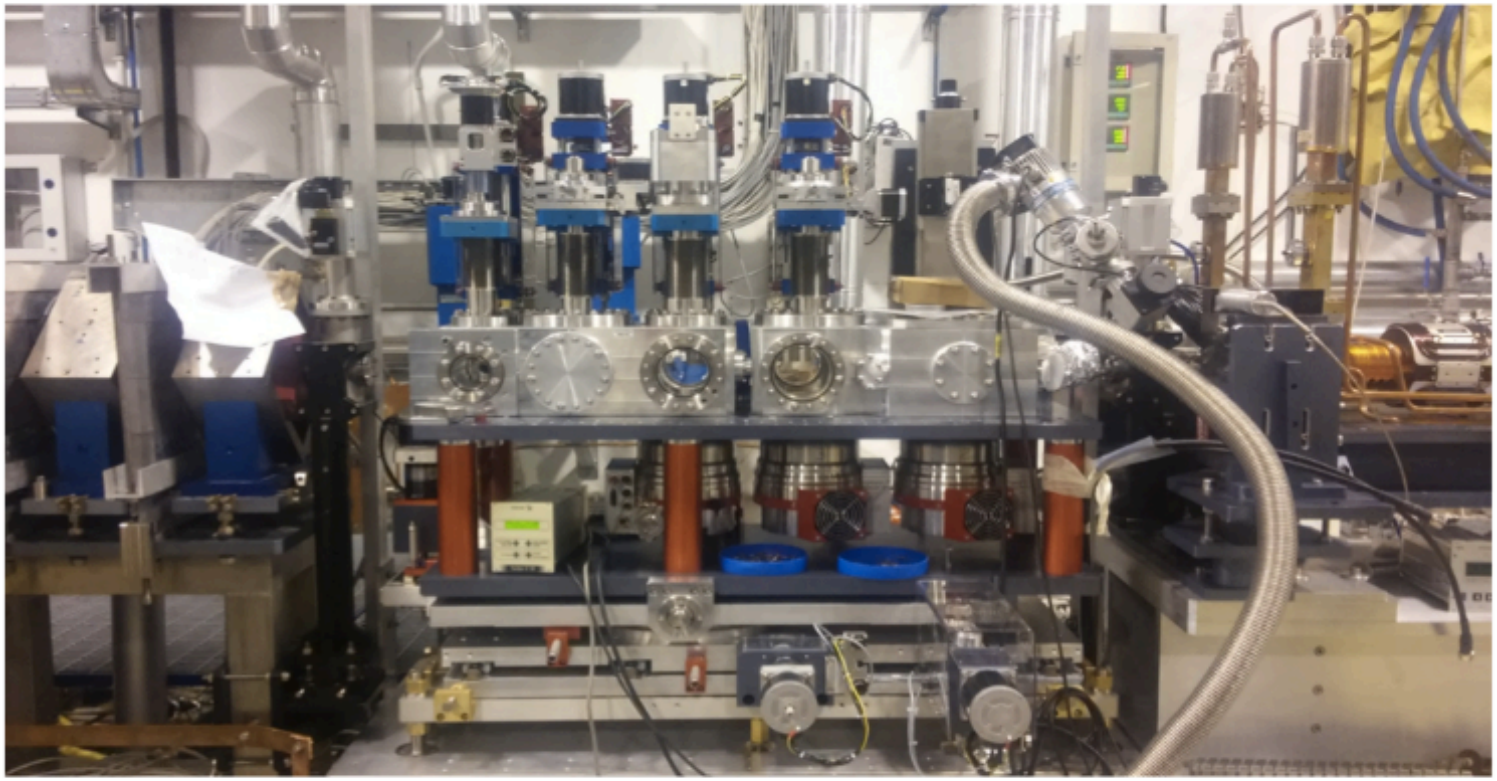
Installations almost completed: layout as it is now:



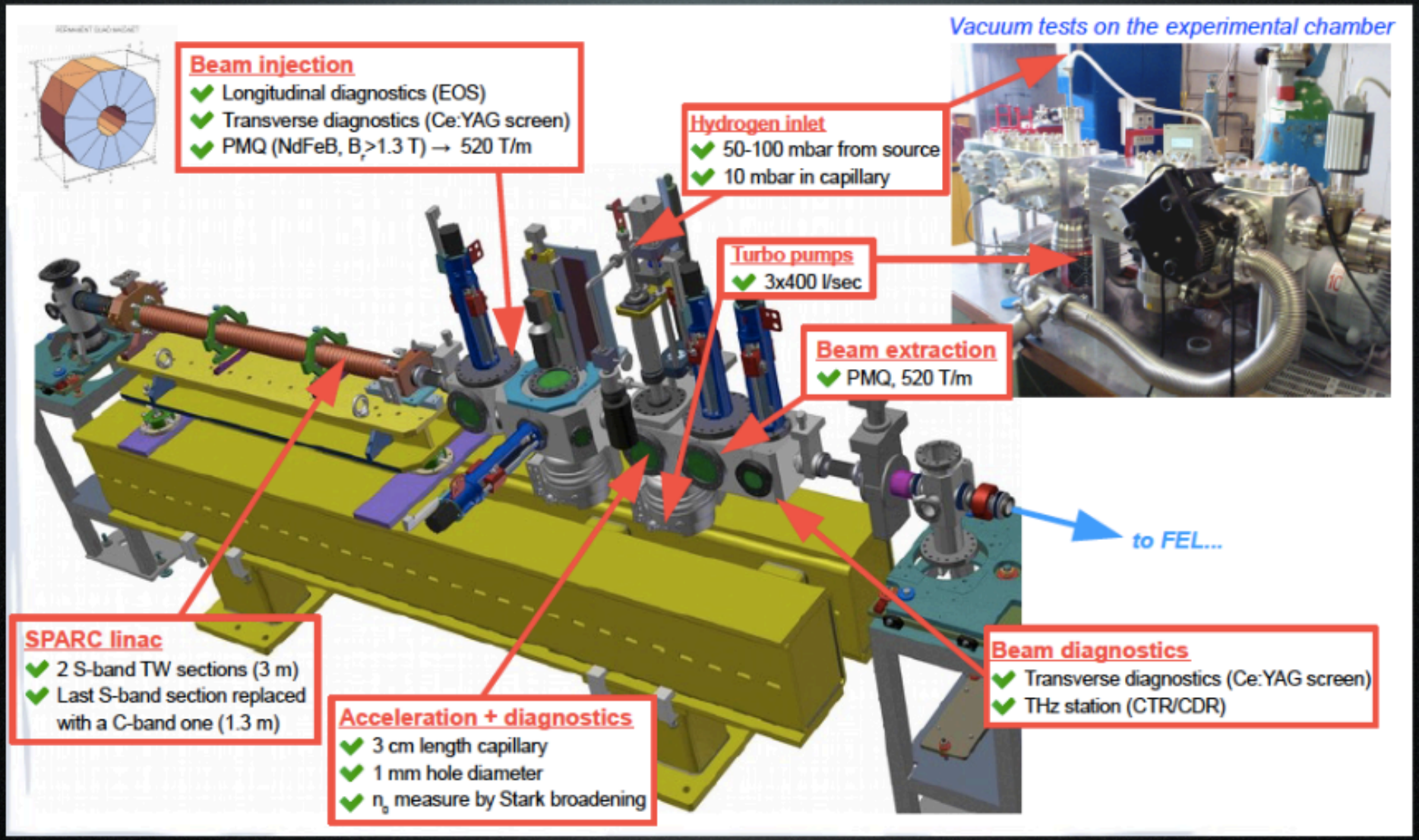
Installations almost completed: layout as it is now:



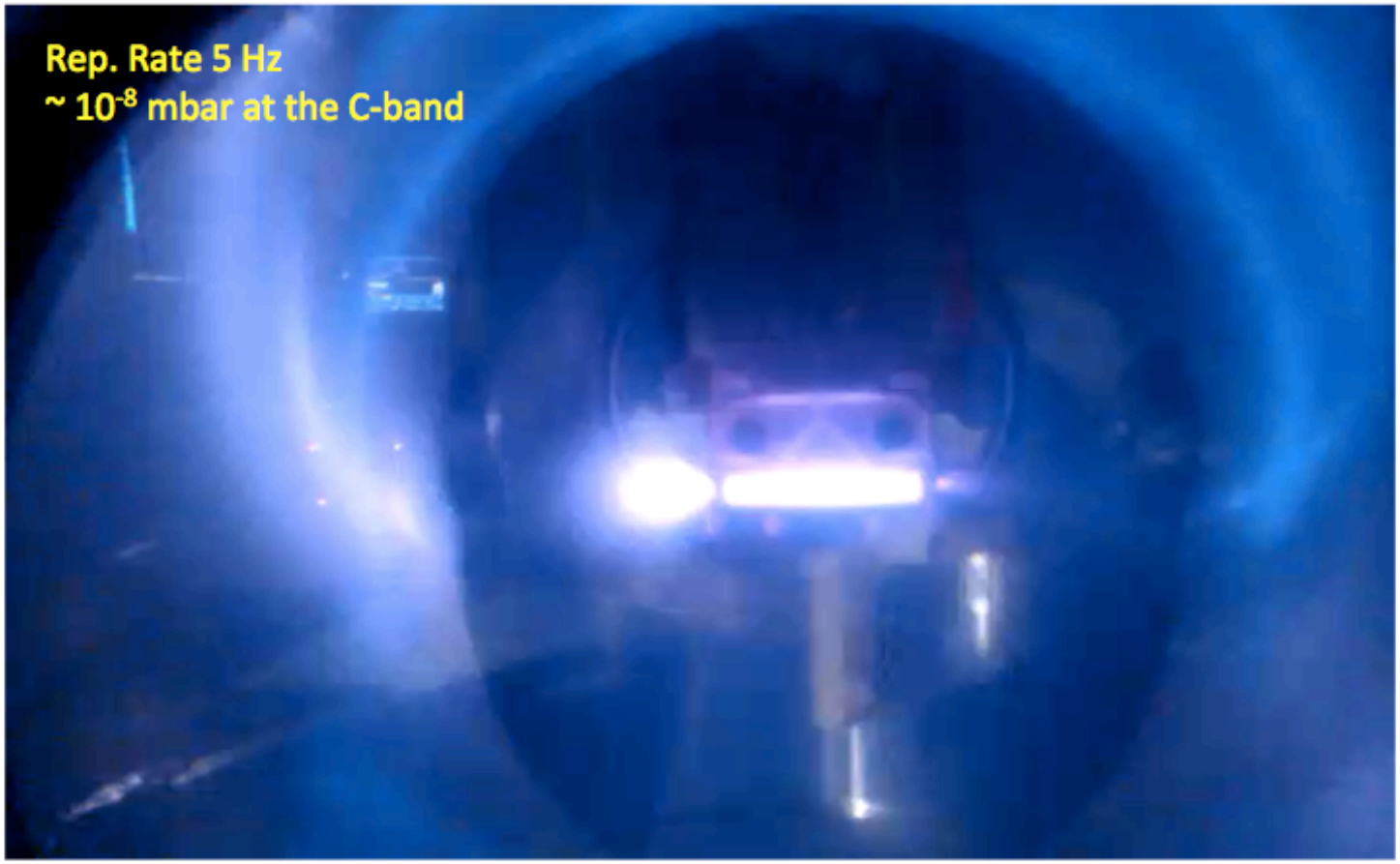
- COMB interaction chamber installed and fully equipped with PMQs and transverse diagnostics
  - EOS camera installed → transverse diagnostics @ COMB chamber entrance
  - OTR target below the capillary → transverse diagnostics at the plasma entrance with micrometer scale resolution



PWFA chamber installed and tested



- Plasma discharge circuit tested online
  - Vacuum tests with discharge done @ 1-5-10 Hz

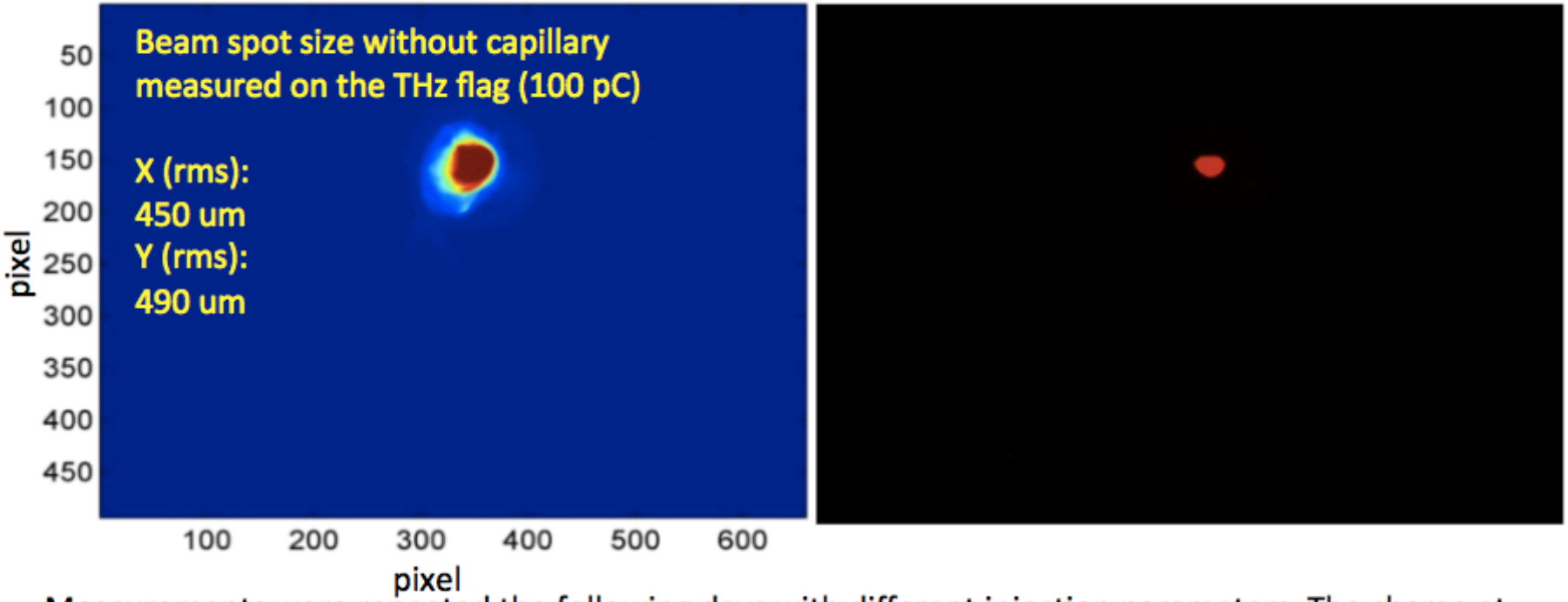


• PWFA: first beam injected in to the plasma

Electron beam parameters
100 pC (at the cathode)
118 MeV

No capillary – no discharge

Through capillary with discharge varying the time delay



Measurements were repeated the following days with different injection parameters. The charge at the plasma exit was maximized to improve transmission, but still few pC were measured on the downstream BCM

SPARC-LAB THz Source

nature COMMUNICATIONS

ARTICLE

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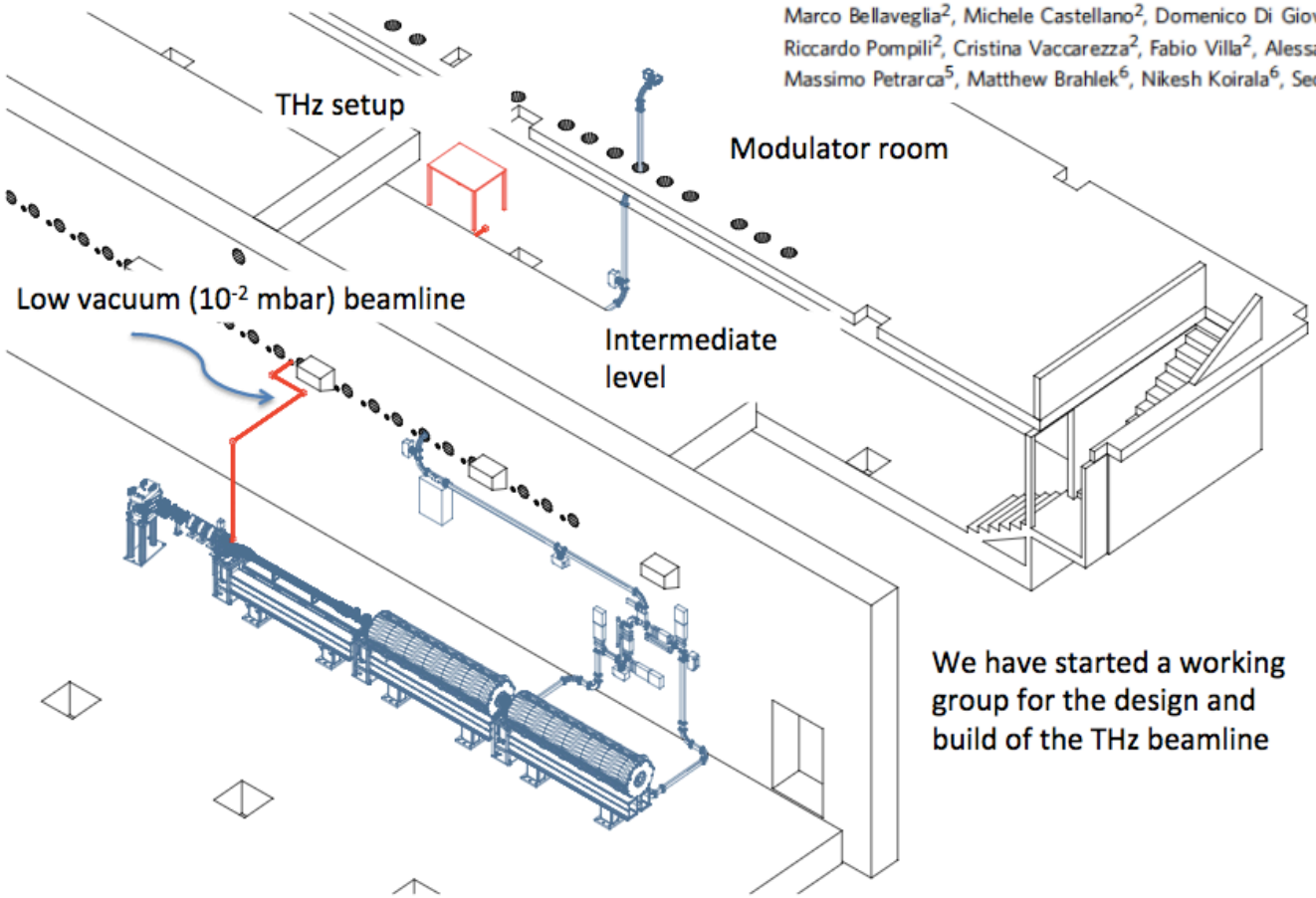
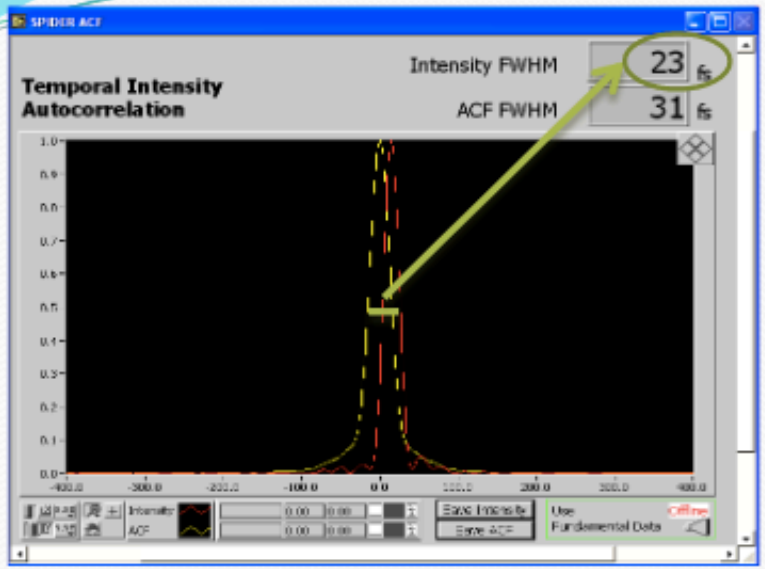
Strong nonlinear terahertz response induced by Dirac surface states in Bi_2Se_3 topological insulator

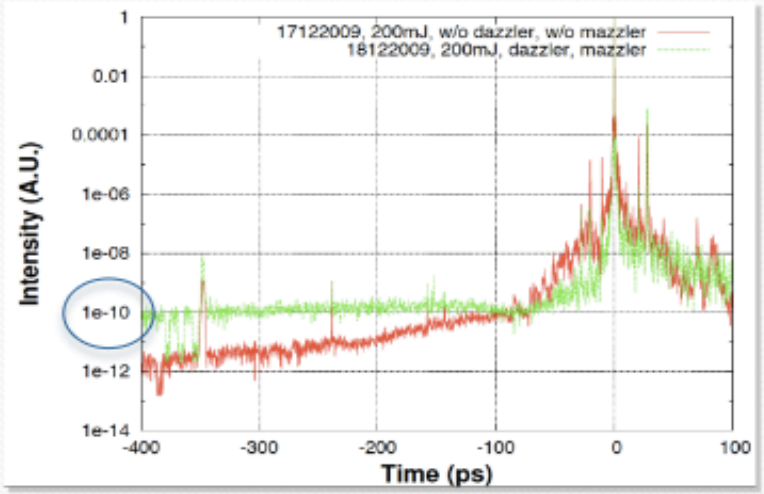
Flavio Giorgianni[1], Enrica Chiadroni[2], Andrea Rovere[1], Mariangela Cestelli-Guidi[2], Andrea Perucchi[3], Marco Bellaveglia[2], Michele Castellano[2], Domenico Di Giovenale[2], Giampiero Di Pirro[2], Massimo Ferrario[2], Riccardo Pompili[2], Cristina Vaccarezza[2], Fabio Villa[2], Alessandro Cianchi[4], Andrea Mostacci[5], Massimo Petrarca[5], Matthew Brahlek[6], Nikesh Koirala[6], Seongshik Oh[6] & Stefano Lupi[1]



We have started a working group for the design and build of the THz beamline

FLAME @ SPARC_LAB





BEST LASER PERFORMANCES:

Max energy before compression: 6J

Max energy on target: ~5J

Min bunch duration: 23 fs

Wavelength: 800 nm

Bandwidth: 60/80 nm

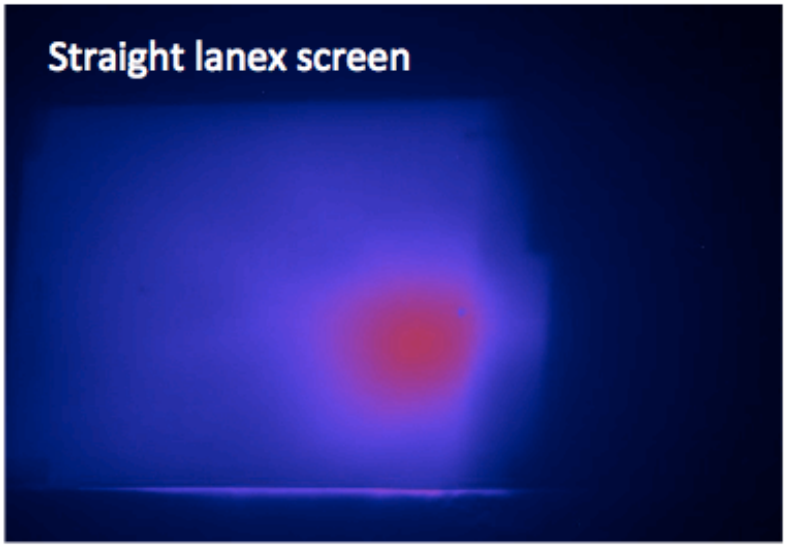
Spot-size @ focus ($1/e^2$): 20 µm

Max power: ~200 TW

Contrast ratio: 10^{10}

FLAME status: OSE' experiment

The experiment is under way.



Electrons have been accelerated up to an energy of about 170 MeV in 4 mm Helium gas-jet.

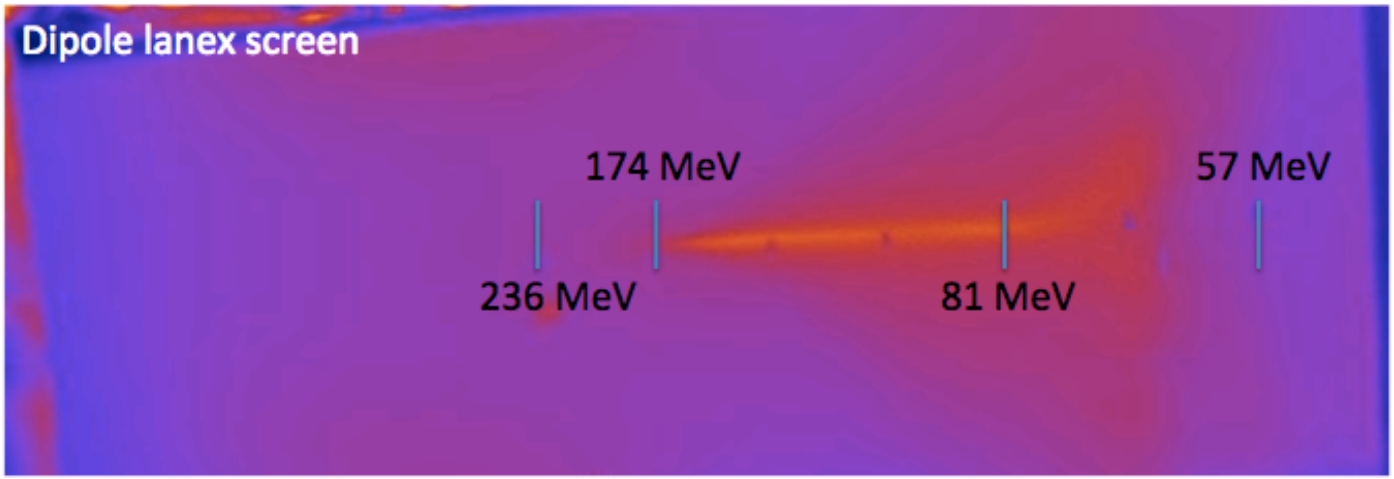
Laser parameters:

Focal spot size (1/e2): 20 x 20 micron

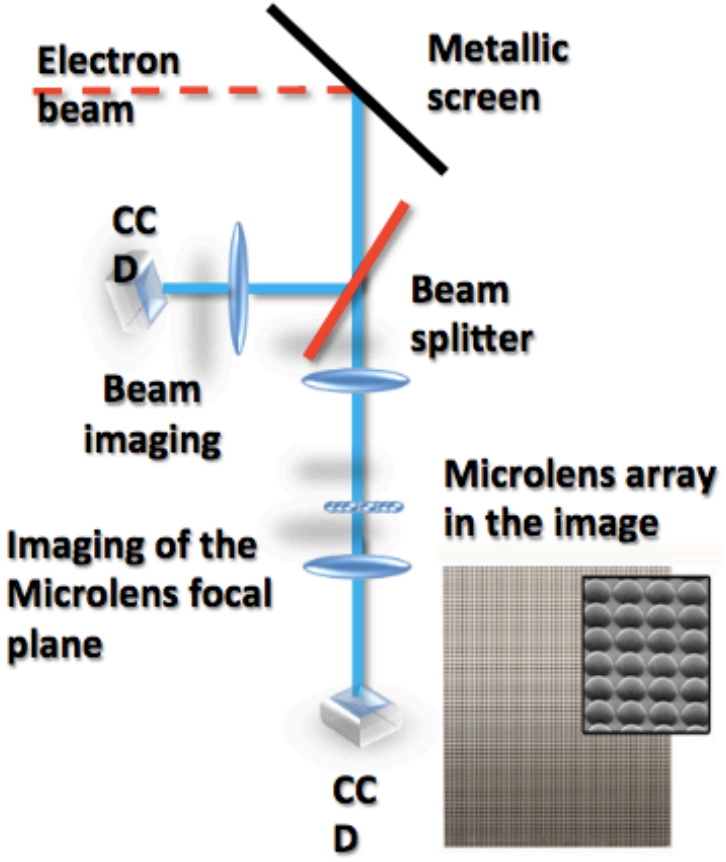
Energy: 2 J

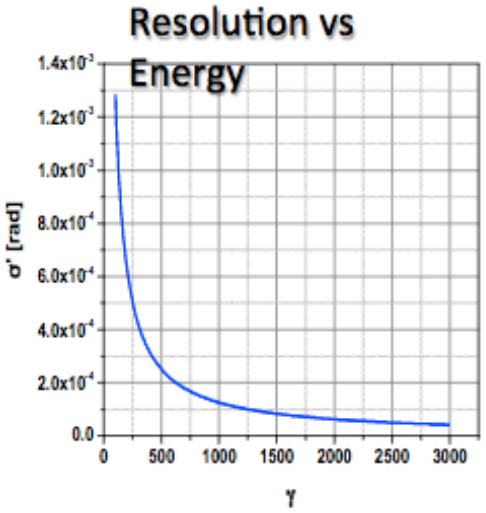
Duration: 35-40 fs.

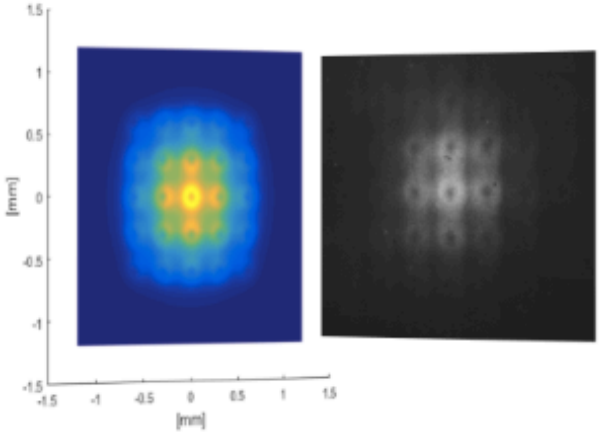
The quality of the electron bunch is not high, but optimization is under going.



OSE (One Shoot Emittance)

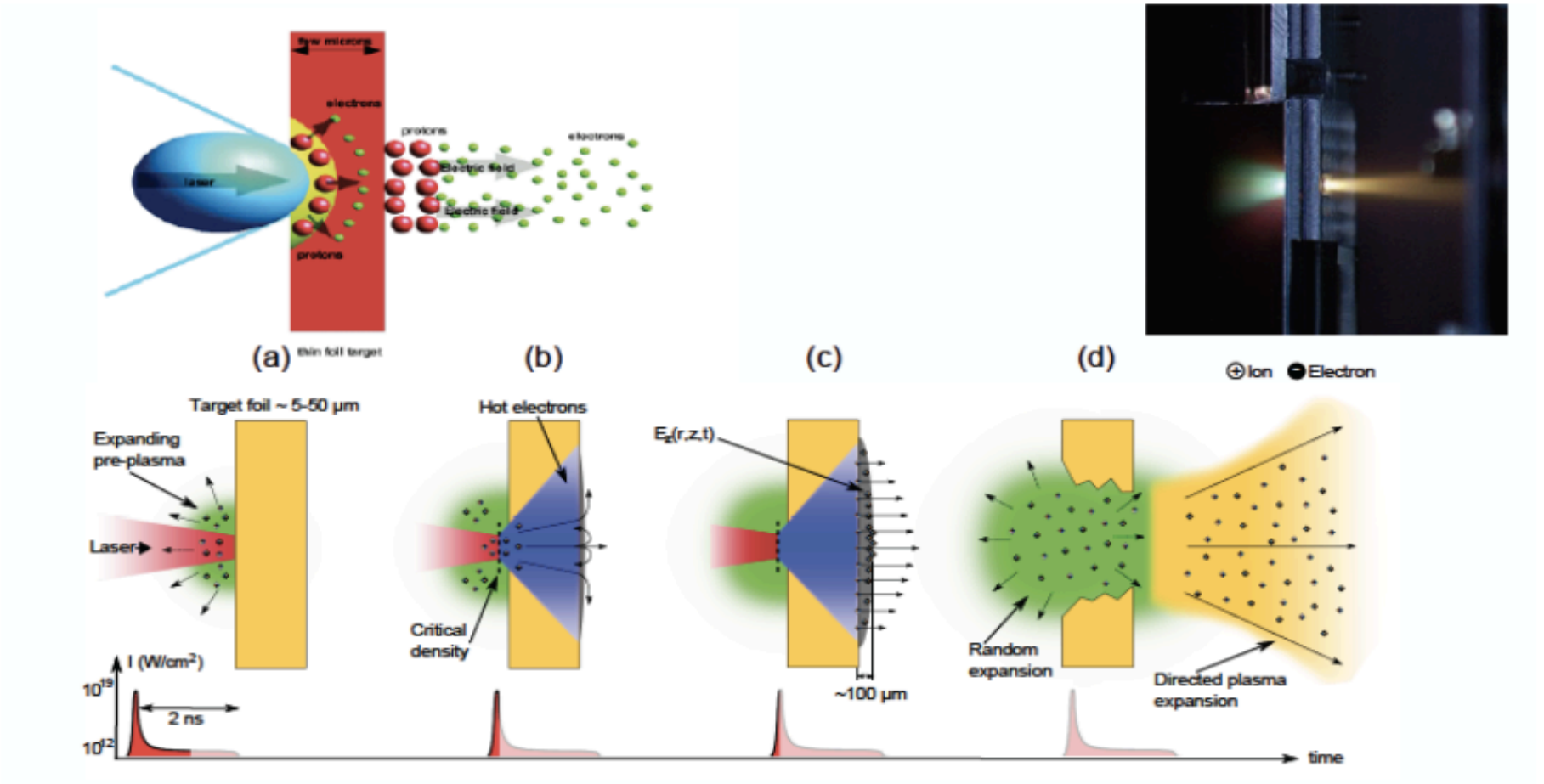




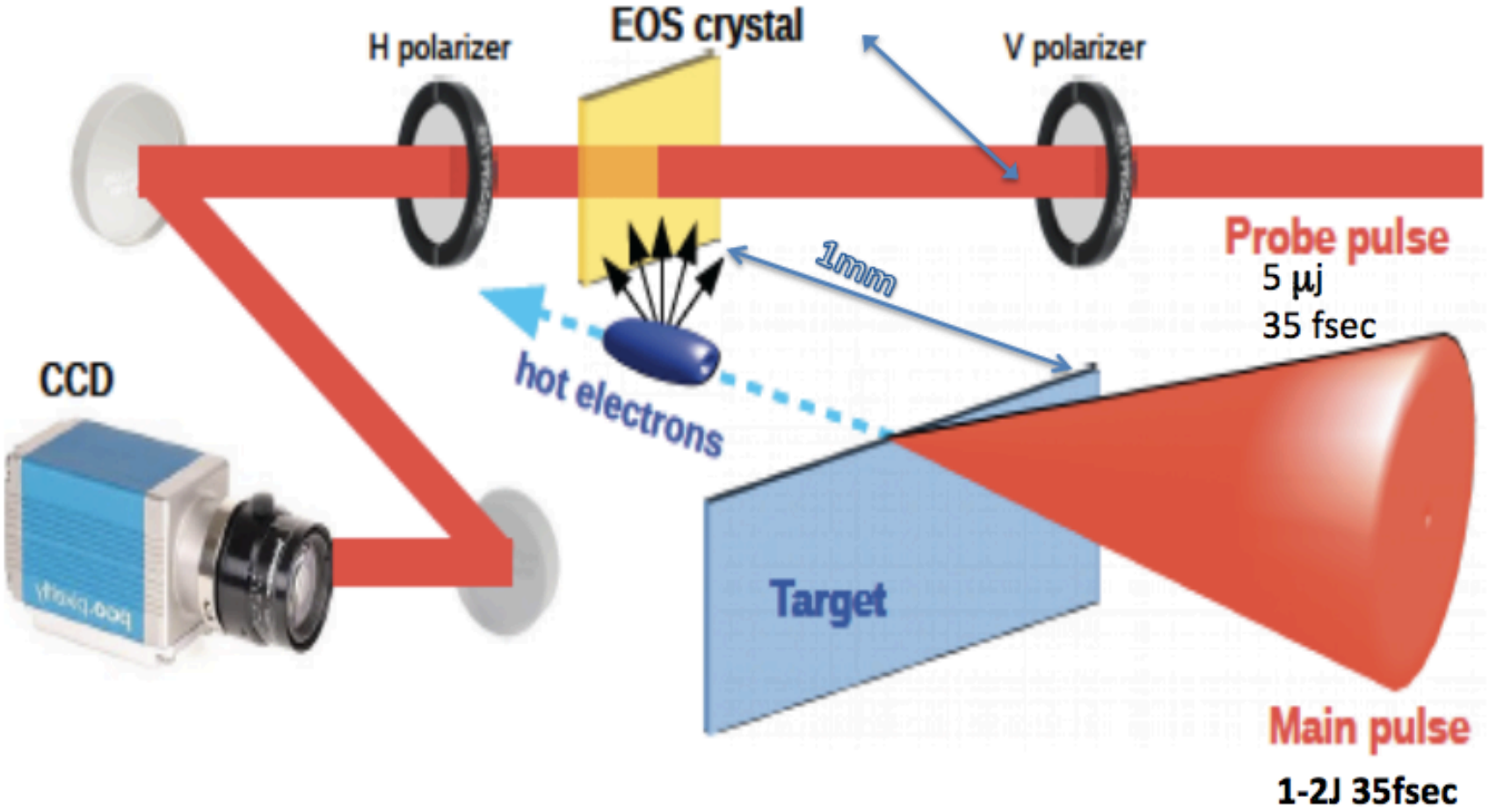


Simulation Measurement

Target Normal Sheath Acceleration field enhancement studies

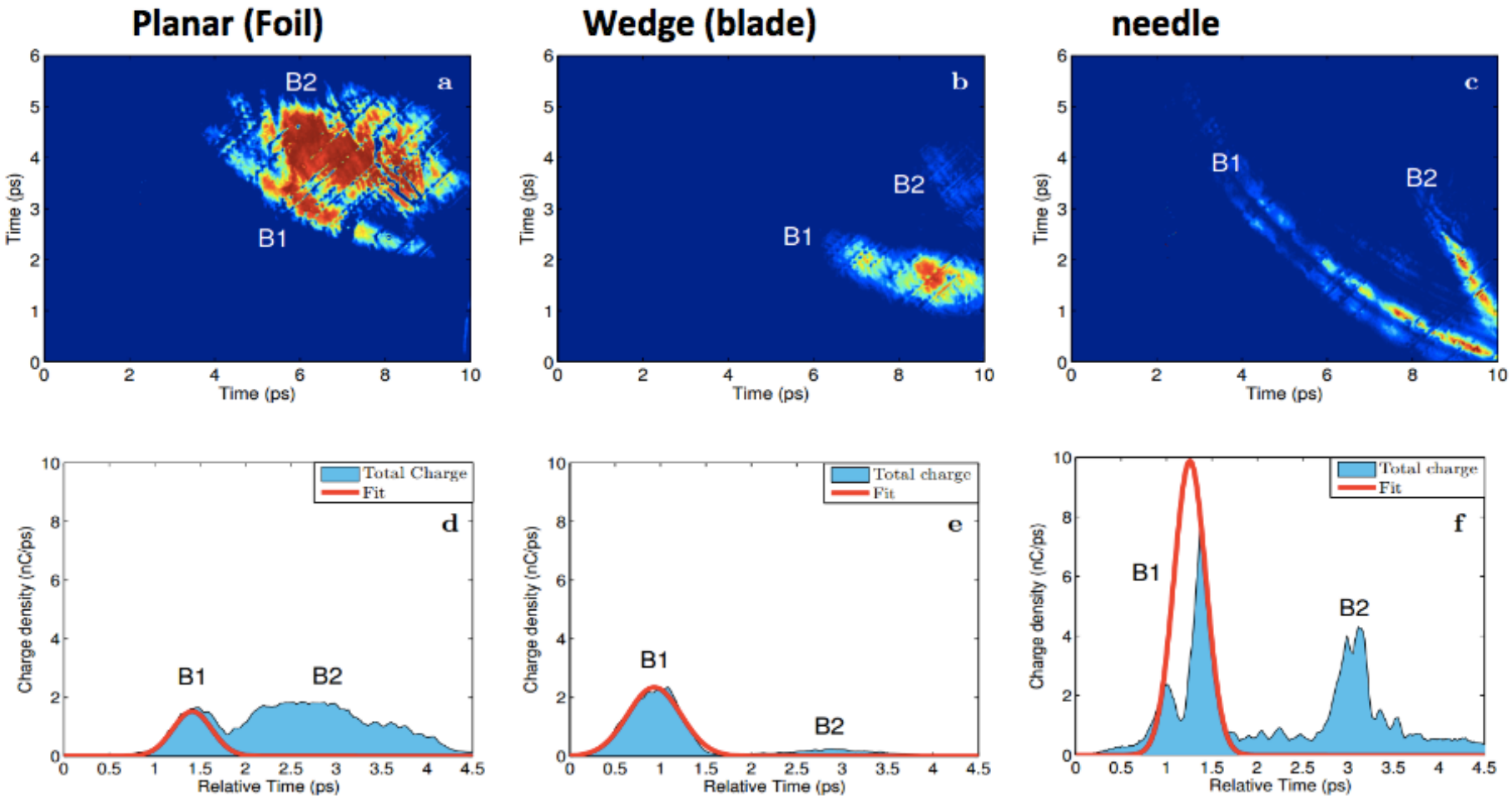


SINGLE-SHOT ONLINE MONITOR FOR THE HOT ELECTRON CLOUD



Schematics for measuring quantity and temporal evolution of the escaping electrons

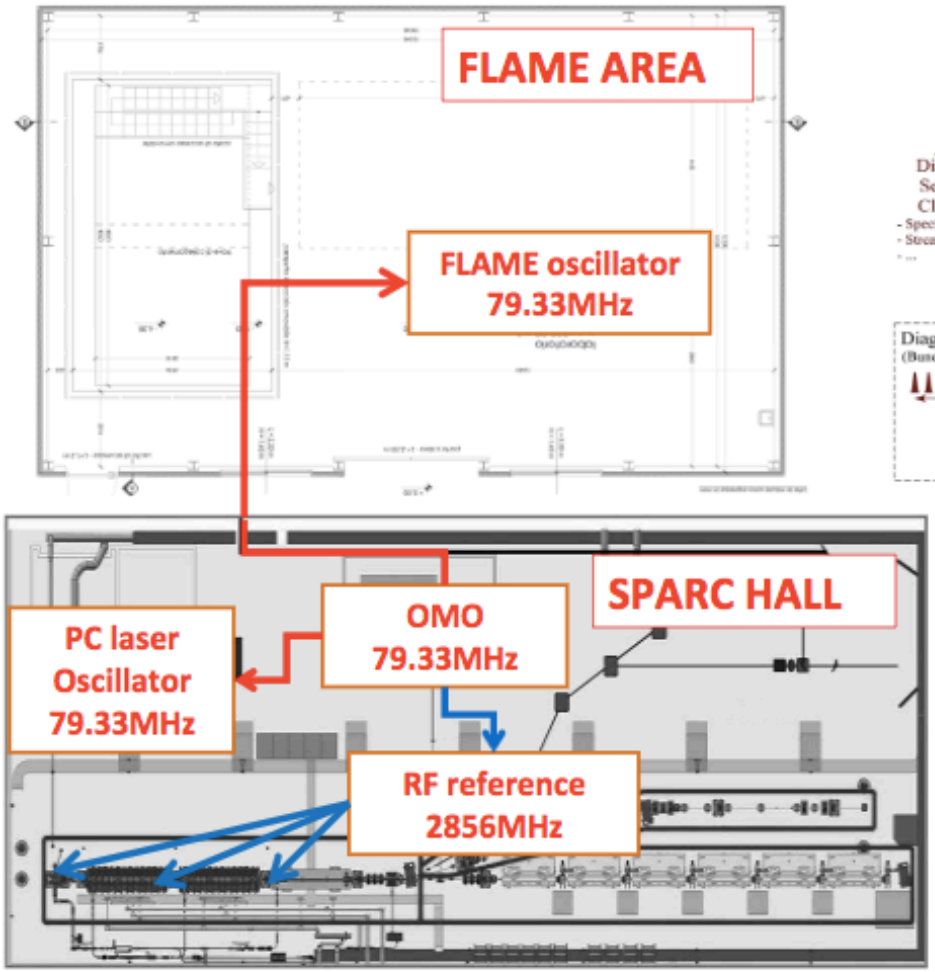
Influence of the target shape on the escaping electrons



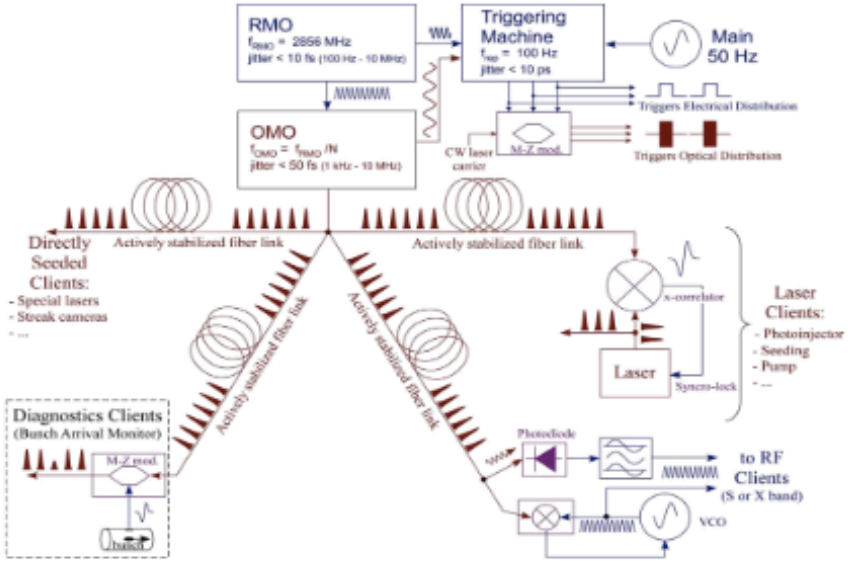
(d-f) Corresponding longitudinal charge profiles.
The main laser parameters are the same in all cases.

General layout of SPARC_LAB synchronization system upgrade

Optical architecture foreseen at SPARC_LAB



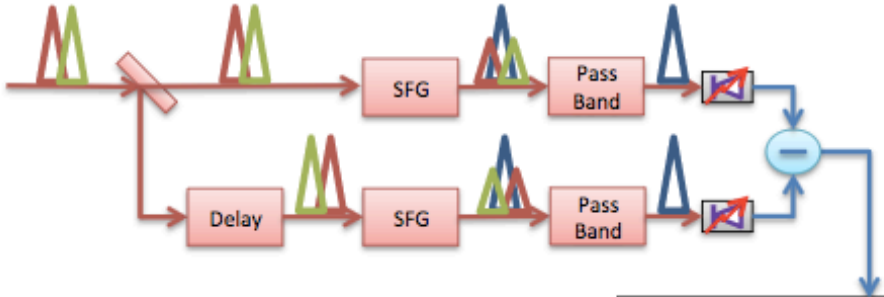
Typical modern synchronization system layout



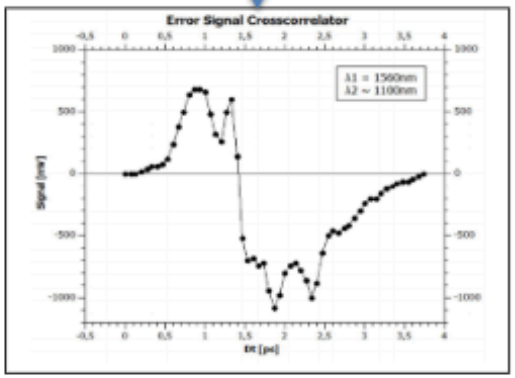
- Present relative jitter performance <50fs RMS (coaxial distribution)
- Upgrade to optical reference signal distribution towards <10fs RMS
- Fiber stabilized link installed and commissioned
- Optical phase detectors (x-correlators) under test @LNF

Commissioning of optical phase detectors

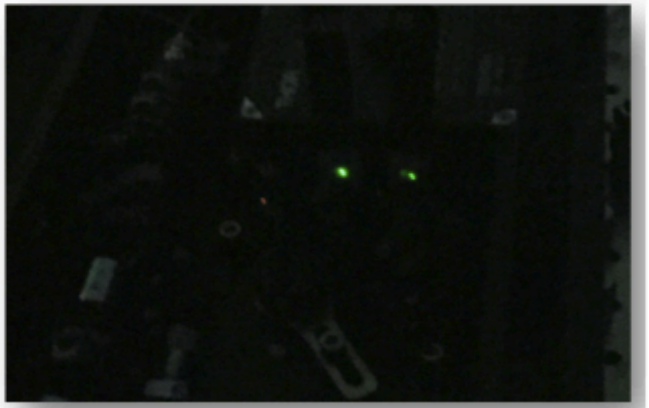
- Used to detect relative timing jitter between Optical Master Oscillator (OMO) and slave laser system
- sensitivity up to **10mV/fs** (~3 order of magnitude better than standard electronic mixing technique)
- commercially available product (see picture below from Menlo Systems)
- commissioning of the device in progress @LNF
- Estimated closed loop jitter reduced to <10fs RMS



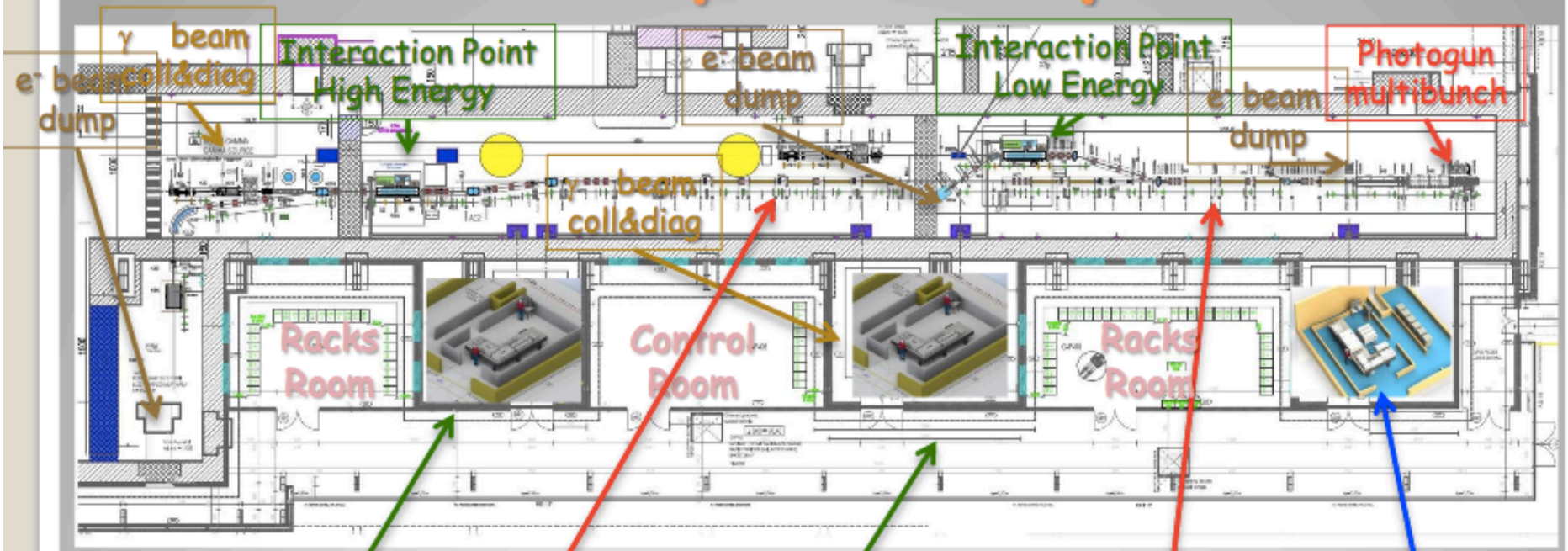
Typical x-correlator characteristics (measured at MENLO Systems GMBH)



Detected signal from one of the SPARC_LAB x-correlators



Gamma Beam System - Layout



Interaction Laser High Energy

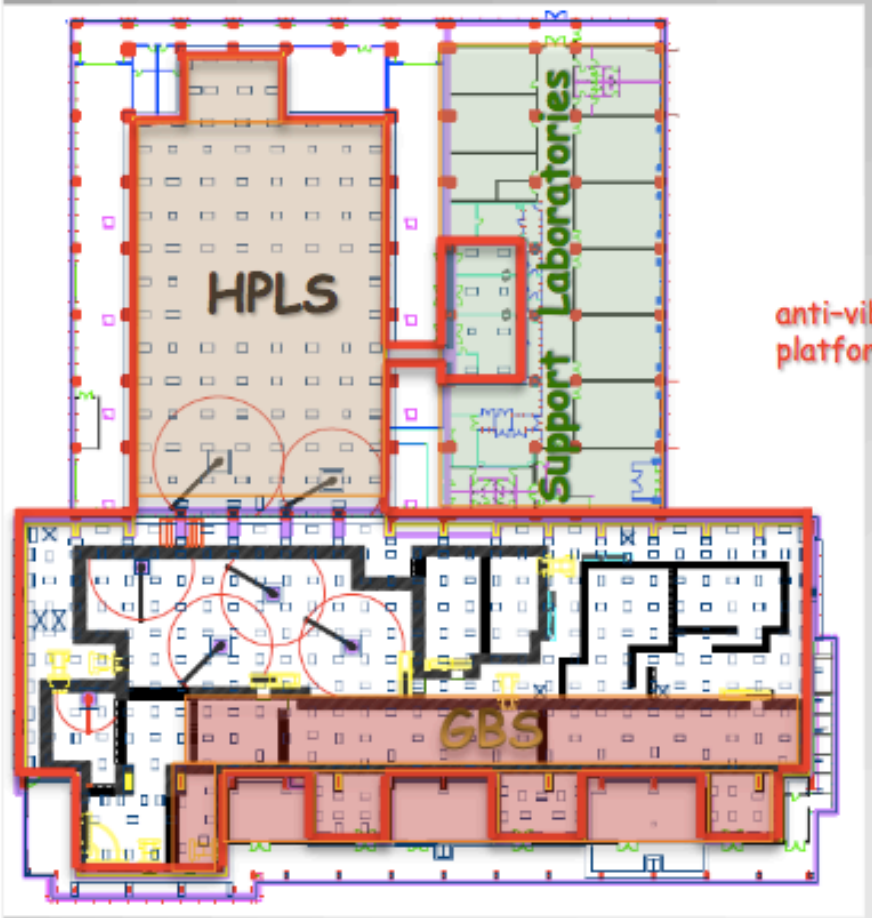
e⁻ RF LINAC High Energy 720 MeV

Interaction Laser Low Energy

e⁻ RF LINAC Low Energy 300 MeV

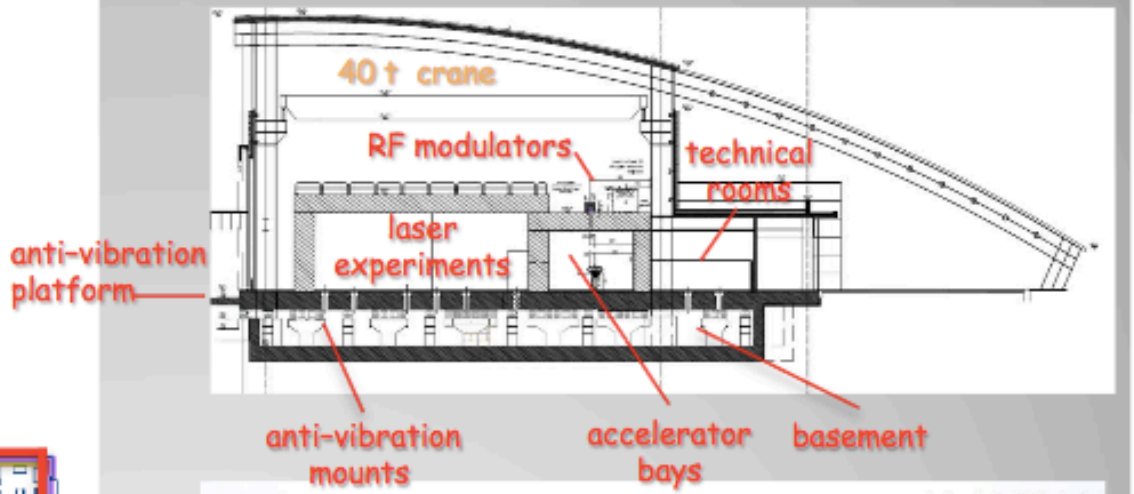
Photo-drive Laser e⁻ source

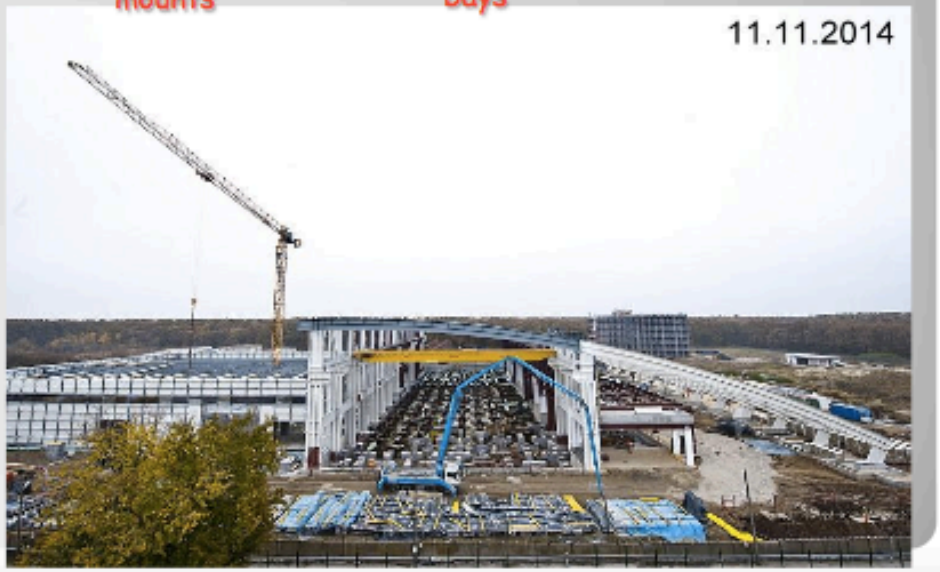
ELI-NP Building Structure



ELI -NP Main Experimental Building ~ 15,000 m²

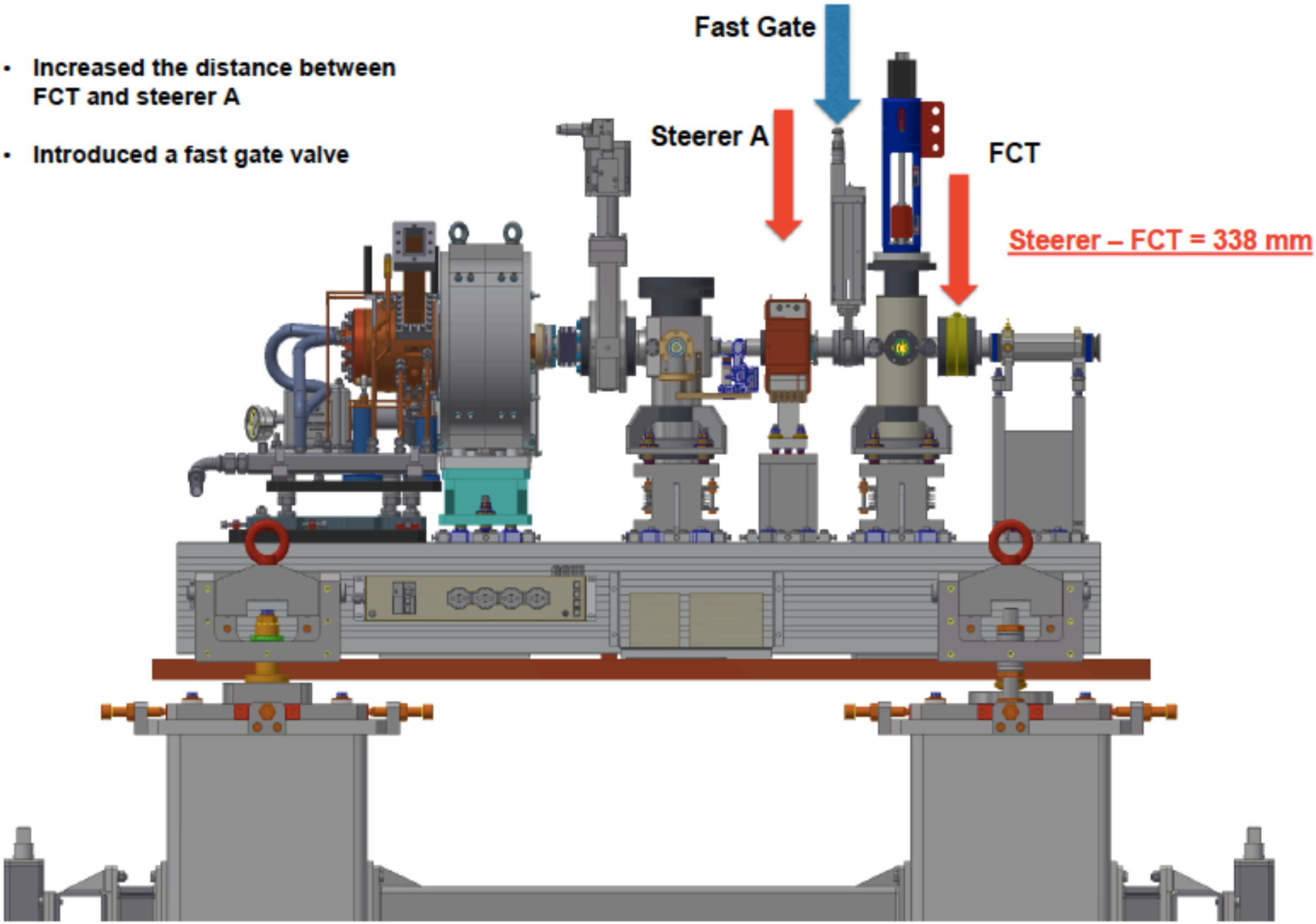
A - A



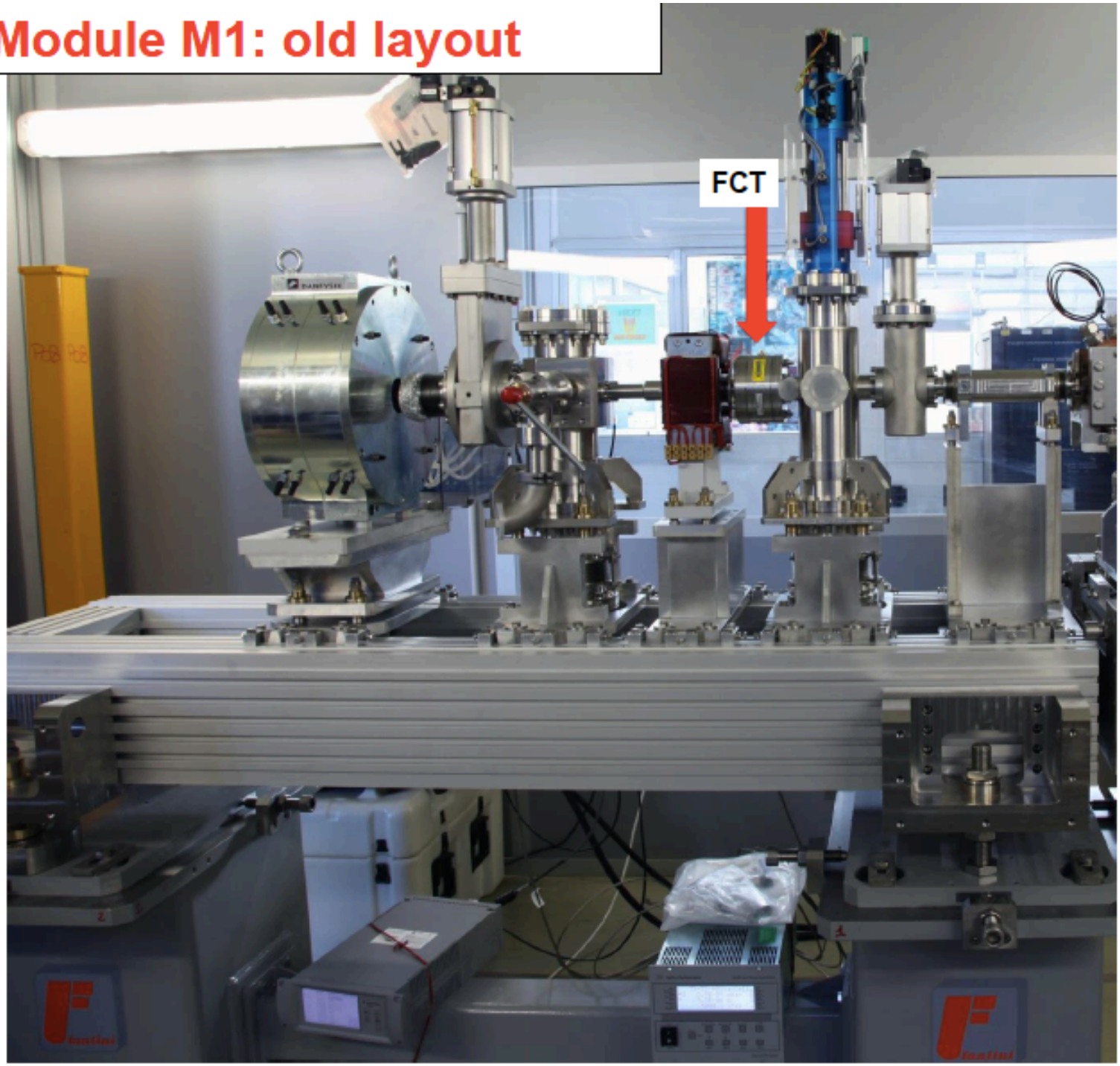


Module M1: present layout

- Increased the distance between FCT and steerer A
- Introduced a fast gate valve

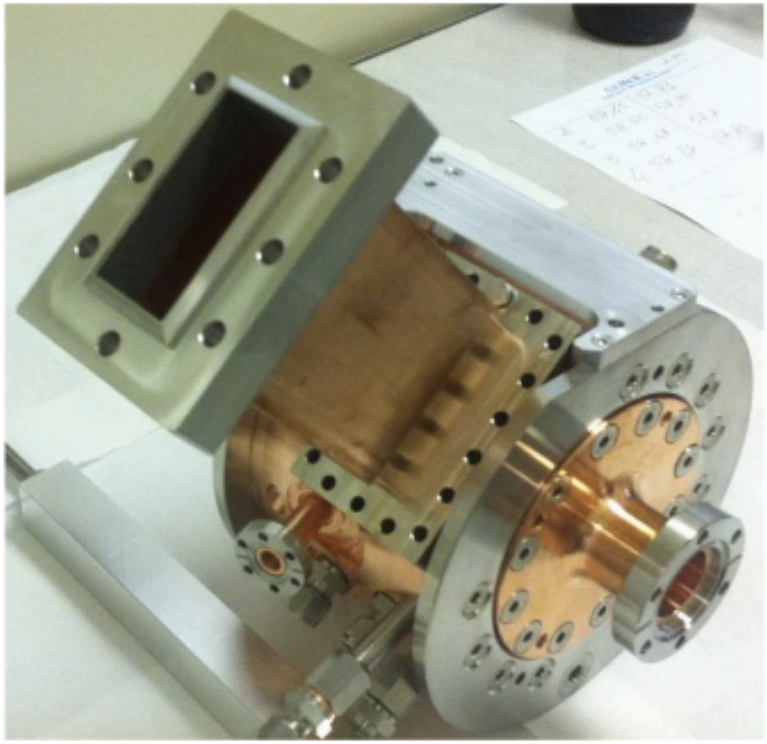


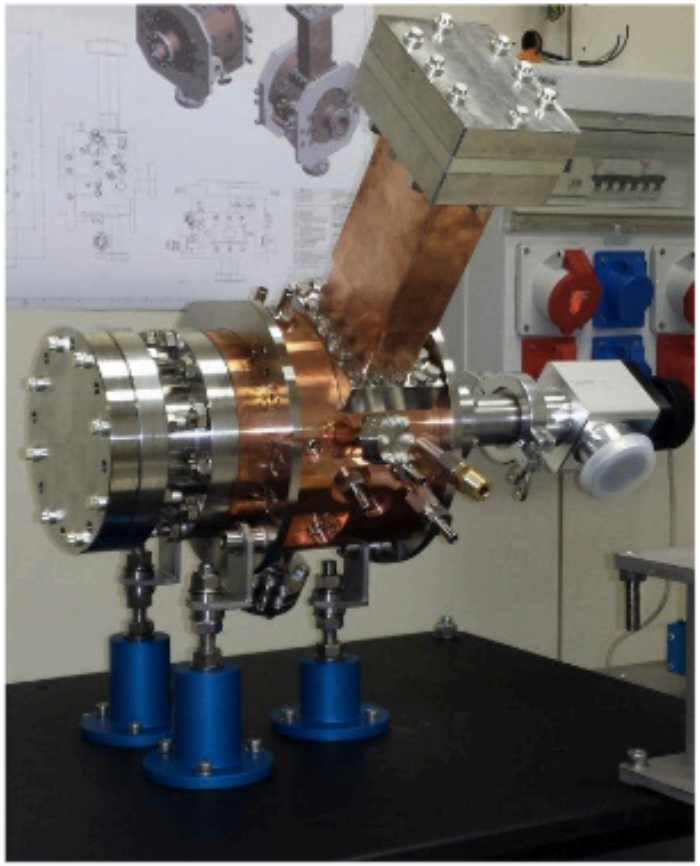
Module M1: old layout



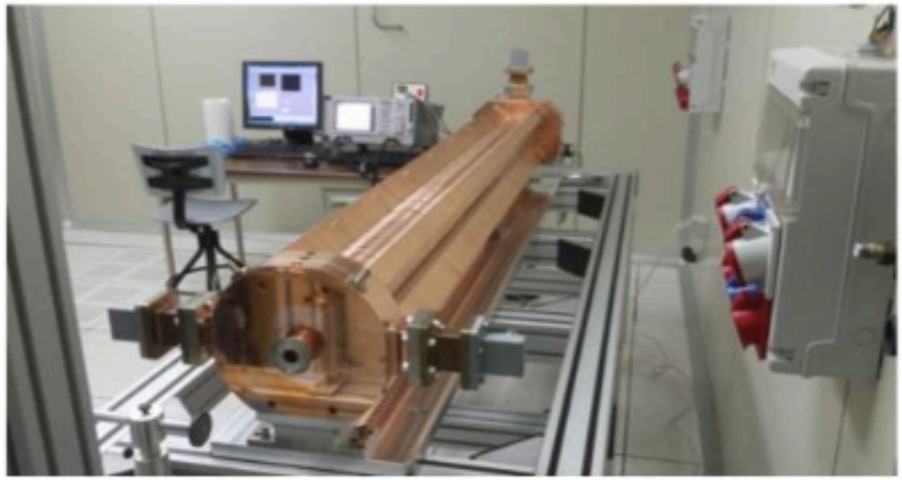
S-BAND GUN: DESIGN

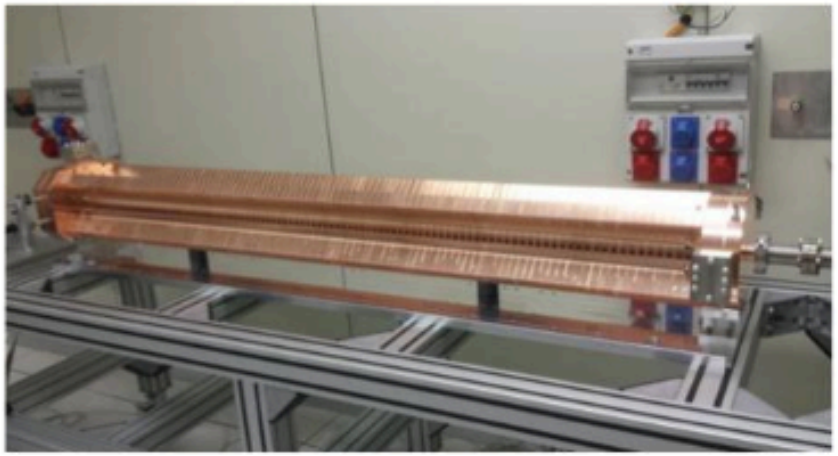
The RF GUN of the ELI NP GBS will be a 1.6 cell gun of the BNL/SLAC/UCLA type but will implement several new features recently integrated in the new gun developed for the SPARC photo-injector:

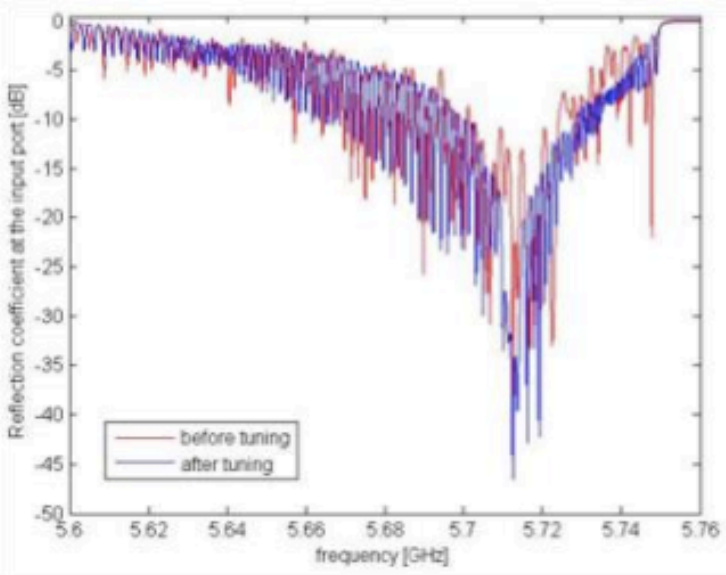


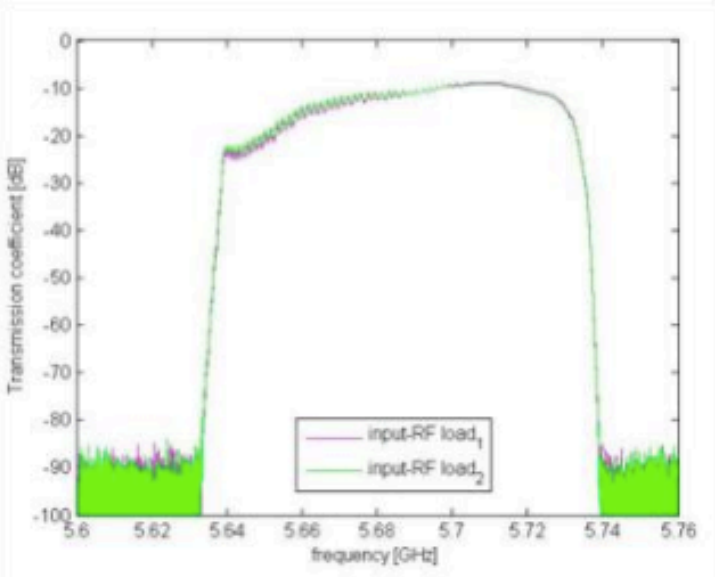


RF C-Band structure







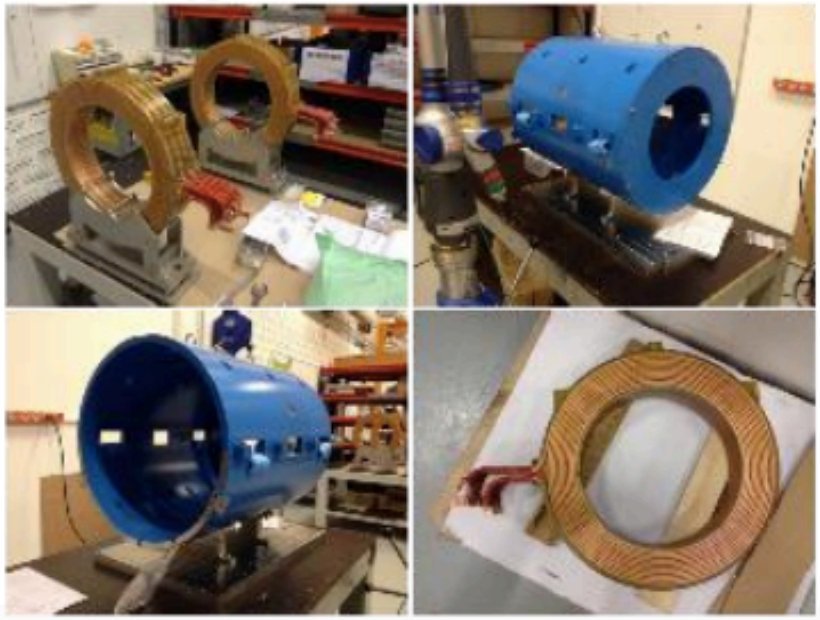


D.Alesini, COMEB
V. Lollo, R. Di Raddo, P. Chimenti, M.Magi, F. Pellegrino,
A. Mostacci, L. Ficcadenti, L.Piersanti, F. Cardelli

Solenoid Type A Tests

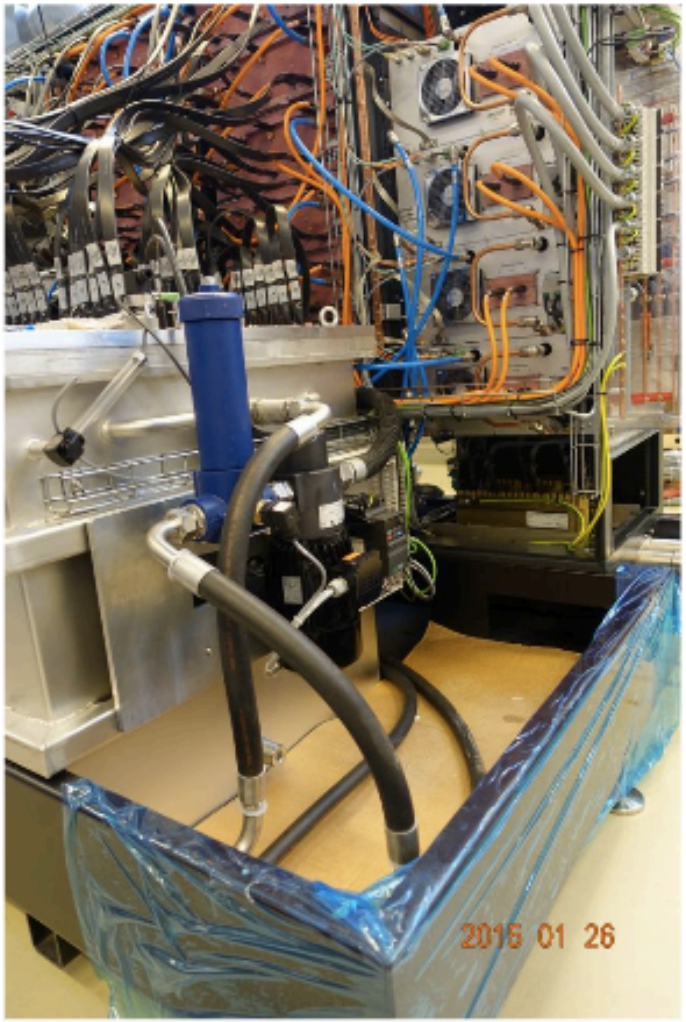
Solenoid type A	Specification	Measurement	Units
Current	176	176	A
Field	0.4	0.413	T
Field integral		60.0	T.mm
Magnetic length	180	145	mm
Field homogeneity at radius 20 mm	$\pm 3.4 \times 10^{-4}$	2.4×10^{-4}	

Solenoid Type B Manufacture



Magnet Type	Tests on coils							Tests on complete magnets				
	Visual inspection	Electrical resistance	Ground insulation	Inter-turn insulation	Hydraulic test	Breakdown test	Full power test	Training	Excitation curve	Magnetic length	Field homogeneity	Rotating coil
Solenoid Type A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Solenoid Type B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Quadrupole Type D	✓	✓	✓	✓	✓	✓	✓	✓	✓	1		✓
Dipole Type A	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	1	
H & V Steerer Type A	✓						✓	✓	✓	✓	✓	
Steerer Type B1 Single plane	✓	✓	✓	✓		✓	✓	✓	✓	✓	1	
Steerer Type B2 Single plane	✓						✓	✓	✓	✓	1	
H & V Steerer Type C	✓						✓	✓	✓	✓	1	

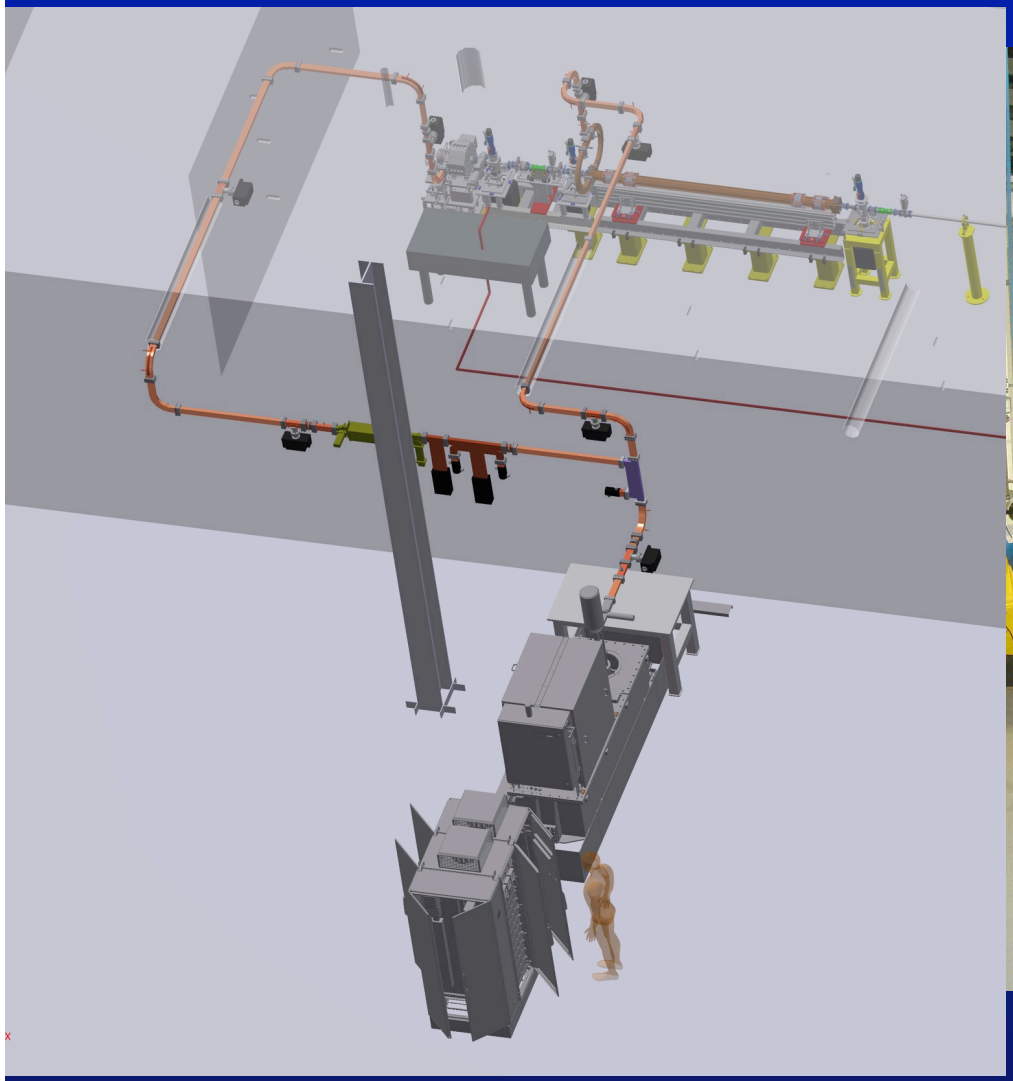
Factory Acceptance Test @ SCANDINOVA



R.Boni,SCANDINOVA,
F.Cardelli,R.Clementi, R.Ceccarelli

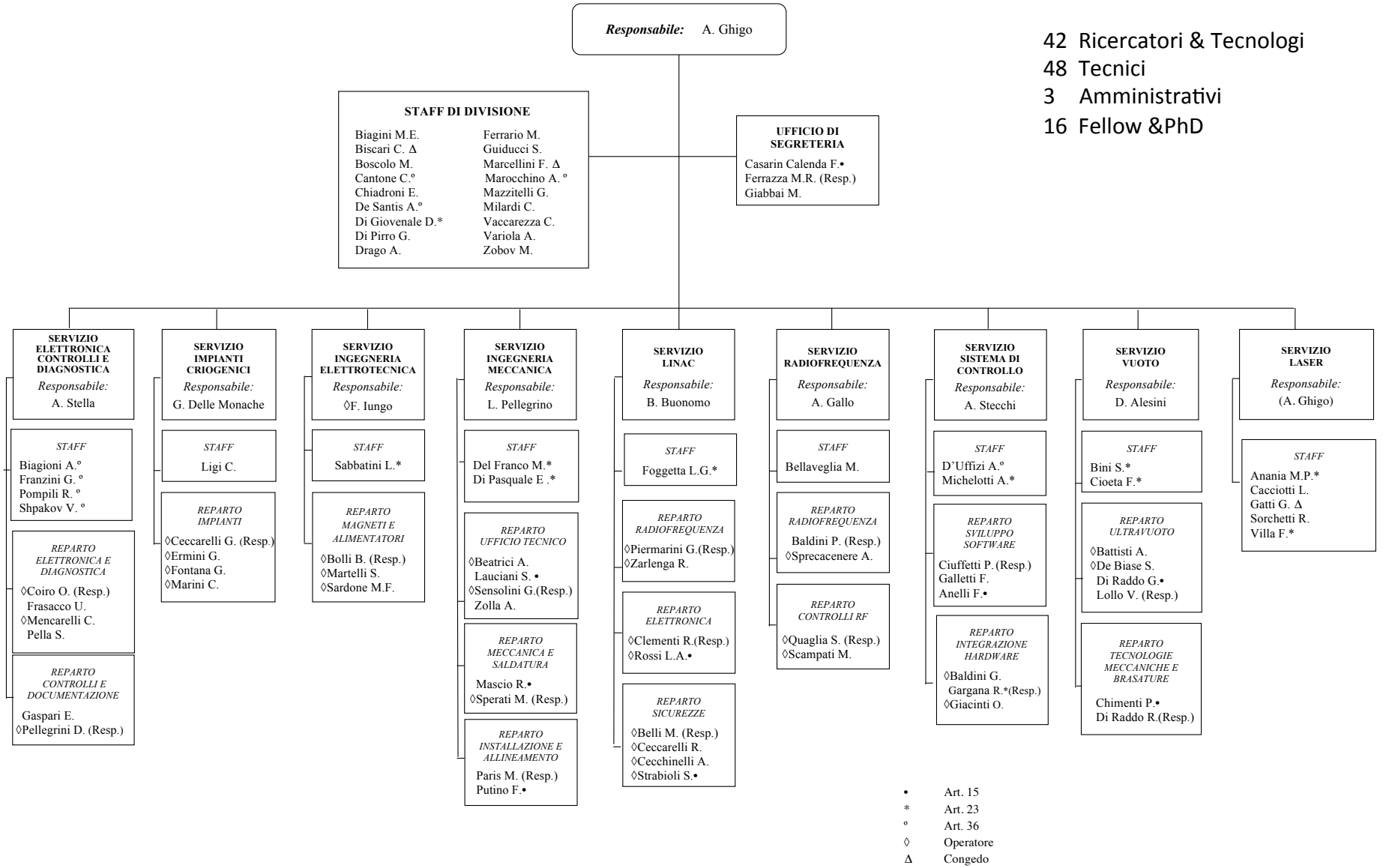
STAR @ UNICAL

STAR RF power



DIVISIONE ACCELERATORI

(STRUTTURA ORGANIZZATIVA AL 3 GIUGNO 2016)



42 Ricercatori & Tecnologi
48 Tecnici
3 Amministrativi
16 Fellow &PhD

• Art. 15
* Art. 23
° Art. 36
◊ Operatore
Δ Congedo

Thanks for your attention

Permanent positions

Servizio	Personale	Profilo	Livello	Incarico	DAFNE	EU pro	SPARC-LAB	ELI-STAR	Operazione e/o laboratorio	Altri progetti	Totale
Elettronica Controlli e Diagnostica	Stella Angelo	Tecnologo	III	Resp. Servizio	20		10	10	60		**100**
	Chiadroni Enrica	Ricercatore	III	staff			100				**100**
	Coiro Oscar	C.T.E.R.	IV	Resp. Reparto					100		**100**
	Frasacco Umberto	OP. TEC.	VI						100		**100**
	Gaspari Eugenio	OP. TEC.	VI						100		**100**
	Mencarelli Claudio	C.T.E.R.	VI						100		**100**
	Pella Stefano	C.T.E.R.	IV						100		**100**
	Pellegrini Donato	C.T.E.R.	IV	Resp. Reparto					100		**100**
Impianti Criogenici	Delle Monache Giovanni	Tecnologo	III	Resp. Servizio	60					40	**100**
	Ligi Carlo	Tecnologo	III	staff	60					40	**100**
	Ceccarelli Giuseppe	C.T.E.R.	V						100		**100**
	De Giorgi Maurizio	C.T.E.R.	IV	Resp. Reparto					100		**100**
	Ermini Giuliano	OP. TEC.	VI						100		**100**
	Fontana Gianni	C.T.E.R.	IV						100		**100**
Ing. Elettro-tecnica	Iungo Franco	C.T.E.R.	IV	Resp. Servizio					100		**100**
	Bolli Bruno	C.T.E.R.	IV	Resp. Reparto					100		**100**
	Ceravolo Sergio	C.T.E.R.	V						100		**100**
	Martelli Stefano	C.T.E.R.	VI						100		**100**
	Sardone Franco	C.T.E.R.	IV						100		**100**
Ing. Meccanica	Pellegrino Luigi	Primo Tecnologo	II	Resp. Servizio	20		20	10	50		**100**
	Beatrici Angelo	C.T.E.R.	IV						100		**100**
	Paris Marco	C.T.E.R.	IV	Resp. Reparto					100		**100**
	Sensolini Giancarlo	C.T.E.R.	IV	Resp. Reparto					100		**100**
	Sperati Maurizio	C.T.E.R.	V	Resp. Reparto					100		**100**
	Tranquilli Tullio	C.T.E.R.	VI						100		**100**
	Troiani Mauro	C.T.E.R.	V						100		**100**
	Zolla Alessandro	C.T.E.R.	IV						100		**100**

Permanent positions

Servizio	Personale	Profilo	Livello	Incarico	DAFNE	EU pro	SPARC-LAB	ELI-STAR	Operazione e/o laboratorio	Altri progetti	Totale
Linac	Buonomo Bruno	Tecnologo	III	Resp. Servizio	50		10		40		**100**
	Belli Maurizio	OP. TEC.	VI	Resp. Reparto					100		**100**
	Ceccarelli Riccardo	C.T.E.R.							100		**100**
	Cecchinelli Alberto	C.T.E.R.	IV						100		**100**
	Clementi Renato	C.T.E.R.	IV	Resp. Reparto					100		**100**
	Martinelli Moreno	C.T.E.R.	IV						100		**100**
	Piermarini Graziano	C.T.E.R.	IV	Resp. Reparto					100		**100**
	Zarlenga Raffaele	C.T.E.R.	IV						100		**100**
Radio-frequenza	Gallo Alessandro	Dirigente Tecnologo	I	Resp. Servizio	30	10	30	10	20		**100**
	Baldini Pietro	C.T.E.R.	IV	Resp. Reparto					100		**100**
	Quaglia Sergio	C.T.E.R.	IV	Resp. Reparto					100		**100**
	Scampati Michele	C.T.E.R.	IV						100		**100**
	Sprecacenere Alfredo	OP. TEC.	VI						100		**100**
Controllo	Stecchi Alessandro	Primo Tecnologo	II	Resp. Servizio	50				40	10	**100**
	Baldini Gianfranco	C.T.E.R.	IV						100		**100**
	Ciuffetti Paolo	C.T.E.R.	VI	Resp. Reparto					90	10	**100**
	Galletti Francesco	C.T.E.R.	IV						90	10	**100**
	Giacinti Olimpio	C.T.E.R.	IV	Resp. Reparto					100		**100**

Permanent positions

Servizio	Personale	Profilo	Livello	Incarico	DAFNE	EU pro	SPARC-LAB	ELI-STAR	Operazione e/o laboratorio	Altri progetti	Totale
Vuoto	Alesini David	Primo Tecnologo	II	Resp. Servizio	20	5	15	40	20		**100**
	Battisti Antonio	C.T.E.R.	IV						100		**100**
	De Biase Sandro	C.T.E.R.	IV						100		**100**
	Di Raddo Roberto	C.T.E.R.	VI	Resp. Reparto			20	40	40		**100**
	Lollo Valerio	C.T.E.R.	IV	Resp. Reparto	20		20	20	30	10	**100**
	Marini Claudio	OP. TEC.	VI						100		**100**
Laser	Andrea GHIGO	Dirigente Tecnologo	I	Resp. Servizio			60	20	20		**100**
	Cacciotti Luciano	C.T.E.R.	IV	staff			50		50		**100**
	Sorchetti Rossano	C.T.E.R.	IV	staff			50		50		**100**
STAFF DA	GHIGO Andrea	Dirigente Tecnologo	I	Resp. Divisione					100		**100**
	Anania Maria Pia	Ricercatore	III	staff			80		20		**100**
	Biagini Maria Enrica	Primo Tecnologo	II	staff	30	70					**100**
	Biscari Caterina	Dirigente Tecnologo	I	congedo							**0**
	Boscolo Manuela	Tecnologo	III	staff	30	70					**100**
	Di Pirro Giampiero	Primo Tecnologo	II	staff	20		60	20			**100**
	Drago Alessandro	Primo Tecnologo	II	staff	40	10	10			40	**100**
	Ferrario Massimo	Dirigente di Ricerca	I	staff			100				**100**
	Guiducci Susanna	Dirigente di Ricerca	I	staff	30	70					**100**
	Marcellini Fabio	Primo Tecnologo	II	congedo							**0**
	Mazzitelli Giovanni	Primo Ricercatore	II	staff						100	**100**
	Milardi Catia	Primo Ricercatore	II	Resp. DAFNE	60	40					**100**
	Tomassini Sandro	Tecnologo	III	staff		20		30		50	**100**
	Vaccarezza Cristina	Primo Tecnologo	II	staff			70	30			**100**
	Variola Alessandro	Dirigente Tecnologo	I	staff				100			**100**
	Zobov Mikhail	Dirigente Tecnologo	II	staff	40	60					**100**
Segreteria	Ferrazza Maria Rita	Funz. di Amministrazione	VI	Resp. Ufficio					100		**100**
	Giabbai Manuela	Funz. di Amministrazione	V								
					580	355	705	330	4620	310	

Temporary Contract

DIVISIONE ACCELERATORI	Nome e COGNOME	TIPOLOGIA	FONDI CONTRATTO	Data Inizio	Data Fine	I contratto	scad 5 anni	% x DAFNE
Servizio Sistema di Controllo	Federico ANELLI	Art. 15 CTER VI	SPARX + ELI-NP	giugno 12	aprile 15	ottobre 06	maggio 17	
	Riccardo GARGANA	Art. 23 Tecnologo III	!CHAOS	gennaio 13	dicembre 16	gennaio 13		50
	Andrea MICHELOTTI	Art. 23 Tecnologo III	!CHAOS	gennaio 13	dicembre 16	gennaio 13		50
	Alessandro D'UFFIZZI	Art. 23 Tecnologo III	ELI-NP	giugno 15	maggio 16			80
Servizio Impianti Critogenici	Lucia SABBATINI	Art. 23 Tecnologo III	ELI-NP	gennaio 13	dicembre 16	gennaio 13		
Servizio Ing. Meccanica	Mario DEL FRANCO	Art. 23 Tecnologo III	EUROFEL	gennaio 13	dicembre 16	gennaio 13		
	Enrico DI PASQUALE	Art. 23 Tecnologo III	ELI-NP	gennaio 13	dicembre 16	dicembre 05		
	Roberto MASCIO	Art. 15 CTER VI	Premiale IRPT	giugno 15	maggio 16	giugno 15		30
	Francesco PUTINO	Art. 15 CTER VI	ELI-NP	maggio 15	aprile 16	maggio 15		30
	LAUCIANI	Art. 15 CTER VI	STAR	giugno 15	maggio 16			20
Servizio Laser	Fabrizio G. BISESTO	ASSEGNISTA	STAR	marzo 14	marzo 16	marzo 14		
	Fabio VILLA	Art. 23	EUROFEL	maggio 14	maggio 17			
Servizio Linac	Luca G. FOGGETTA	Art. 23 Tecnologo III	INFN	aprile 14	settembre 16	ottobre 10		
	Luis Antonio ROSSI	Art. 15 CTER	TIARA + ELI-NP	novembre 11	marzo 16	febbraio 05	ottobre 16	80
	Serena STRABIOLI	Art. 15 CTER	ELI-NP	agosto 11	agosto 16	marzo 05	agosto 16	80
Servizio Radiofrequenza	Marco BELLAVEGLIA	Art. 23 Tecnologo III	TIARA + ELI-NP	gennaio 12	marzo 17	ottobre 04	marzo 15	
Servizio Vuoto	Simone BINI	Art. 23 Tecnologo III	EUROFEL	gennaio 13	dicembre 16	luglio 09		30
	Paolo CHIMENTI	Art. 15 CTER VI	ELI-NP	settembre 12	settembre 15	ottobre 04	agosto 17	30
	Fara CIOETA	Art. 23 Tecnologo III	ELI-NP	gennaio 13	dicembre 17	gennaio 13		
Staff	Maria Pia ANANIA	Art. 23 ricercatore III	EUROFEL	dicembre 13	dicembre 16	dicembre 11		
	Antonio DE SANTIS	Art. 23 ricercatore III	INFN	31 marzo 15	1 aprile 17	aprile 09		100
	Domenico DI GIOVENALE	Art. 23 tecnologo III	ELI-NP	giugno 12	giugno 16	giugno 12		
	Oscar FRASCIELLO	Assegnista	Hi Lumi	giugno 13	maggio 15	giugno 11		
	Eliana GIOSCIO	Assegnista	!CHAOS	novembre 13	dicembre 15	novembre 13		
Segreteria	Francesca CASARIN	Art. 15 CollAmm	ELI-NP	dicembre 13	dicembre 15	marzo 04	dicembre 18	
								580

PhD Student and Fellows

OSPITI	**Gianluca BORGESE**	OSPITE	**STAR**		luglio 15
	Luca PIERSANTI	OSPITE	**ELI**		settembre 15
	Alessandro VANNOZZI	OSPITE	**ELI**		settembre 15
	Luca FICCADENTI	OSPITE	**SPARC-LAB**		dicembre 15
	Fabio CARDELLI	OSPITE	**ELI**		giugno 17
	Stefano PIOLI	OSPITE	**ELI**		dicembre 18
	Anna GIRIBONO	OSPITE	**SPARC-LAB**		giugno 17
	Francesco FILIPPI	OSPITE	**SPARC-LAB**		giugno 17

ASSOCIATI	**Fabrizio Giuseppe BISESTO**	ASSOCIATO	**STAR**		marzo 16
	Michele CROIA	ASSOCIATO	**SPARC-LAB**		giugno 18
	Alessandro CURCIO	ASSOCIATO	**SPARC-LAB**		giugno 18
	Maddalena DANIELE	ASSOCIATO	**SPARC-LAB**		dicembre 17
	Riccardo POMPILI	ASSOCIATO	**SPARC-LAB**		dicembre 15
	Stefano ROMEO	ASSOCIATO	**SPARC-LAB**		giugno 17
	Jessica SCIFO	ASSOCIATO	**SPARC-LAB**		giugno 18