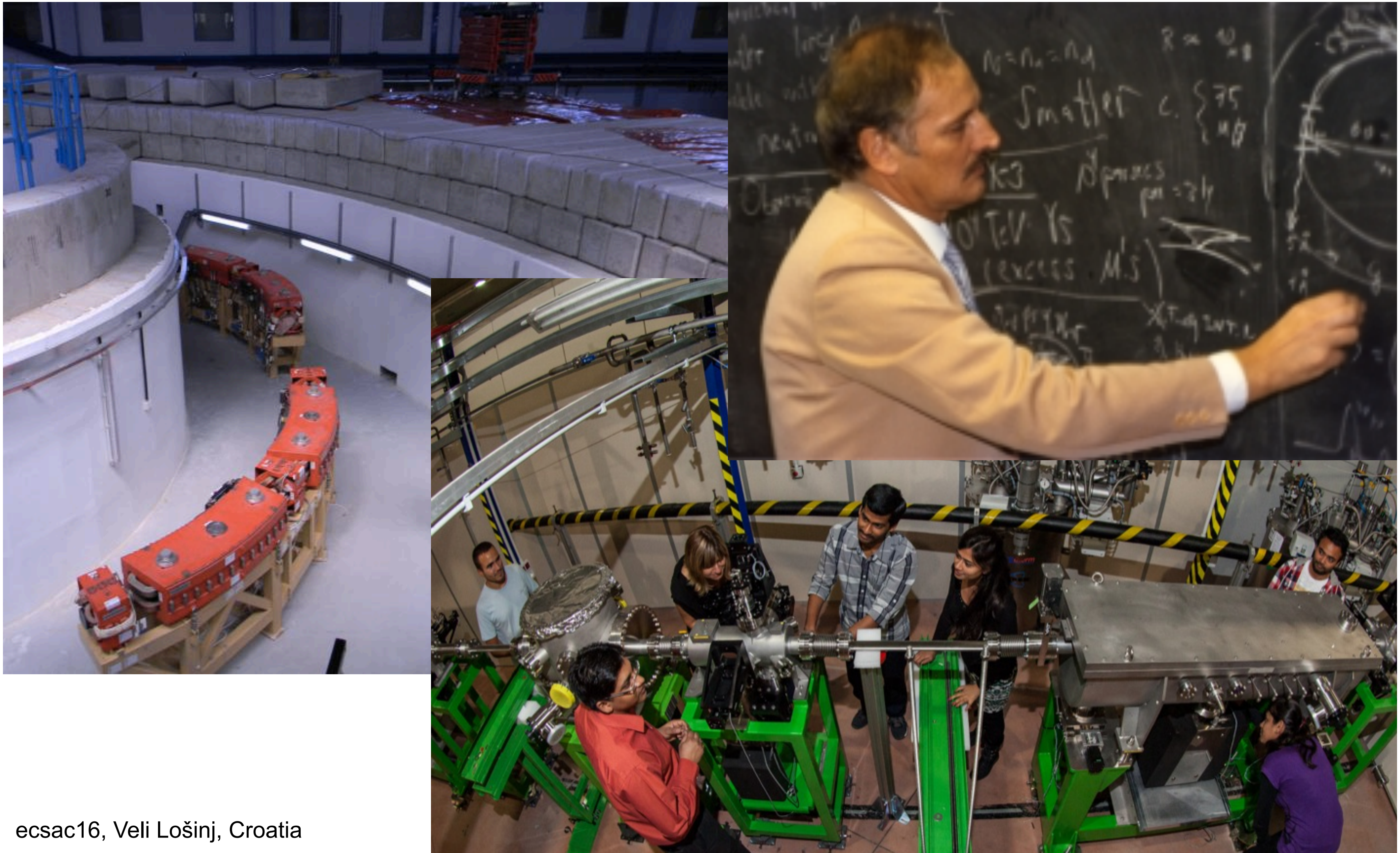
An Introduction to Elettra-Sincrotrone Trieste

Andrea Lausi
Elettra-Sincrotrone Trieste S.C.p.A.

Elettra
Sincrotrone
Trieste

Synchrotron Light Facilities: Cultural Science Centers in continuous evolution



ecsac16, Veli Lošinj, Croatia

Elettra Sincrotrone Trieste

Elettra-Sincrotrone Trieste S.C.p.A.

✓ A nonprofit shareholder company of national interest:

AREA Science Park	53.7%
FVG Regional Government	37.6%
CNR	4.9%
Invitalia Partecipazioni S.p.A.	3.8%

✓ Established in 1987 to construct and manage synchrotron light sources – international facility

-> Promote cultural and socioeconomic growth at the regional, national and international level

->State-of-the art research facilities, technical leadership, skill development and transfer

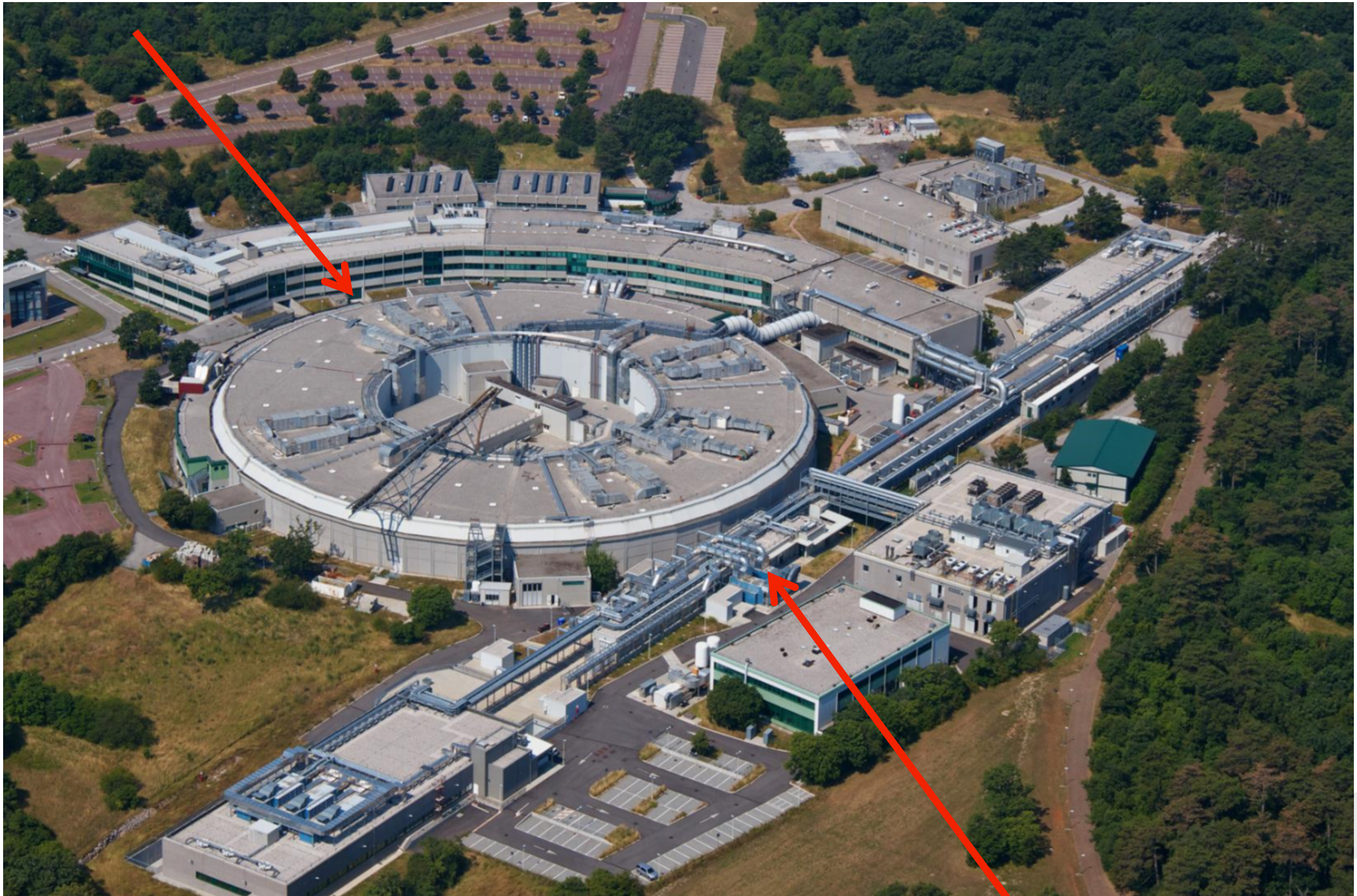
Elettra
Sincrotrone
Trieste

Elettra-Sincrotrone Trieste in a nutshell

2015 budget:	**59.7 M€**
Recurrent government funding:	26.8 M€
National and International projects:	28.4 M€
Friuli Venezia Giulia regional grants:	2.1 M€
Direct industrial income:	2.4 M€

Total payroll:	**457**
Permanent employees:	261
Term employees:	54
Collaborators/consultants:	35
Fellows:	50
Research associates:	20
Trainees:	22
Temporary staff:	15

Elettra 2.0-2.4 GeV 3rd generation Synchrotron Radiation Facility



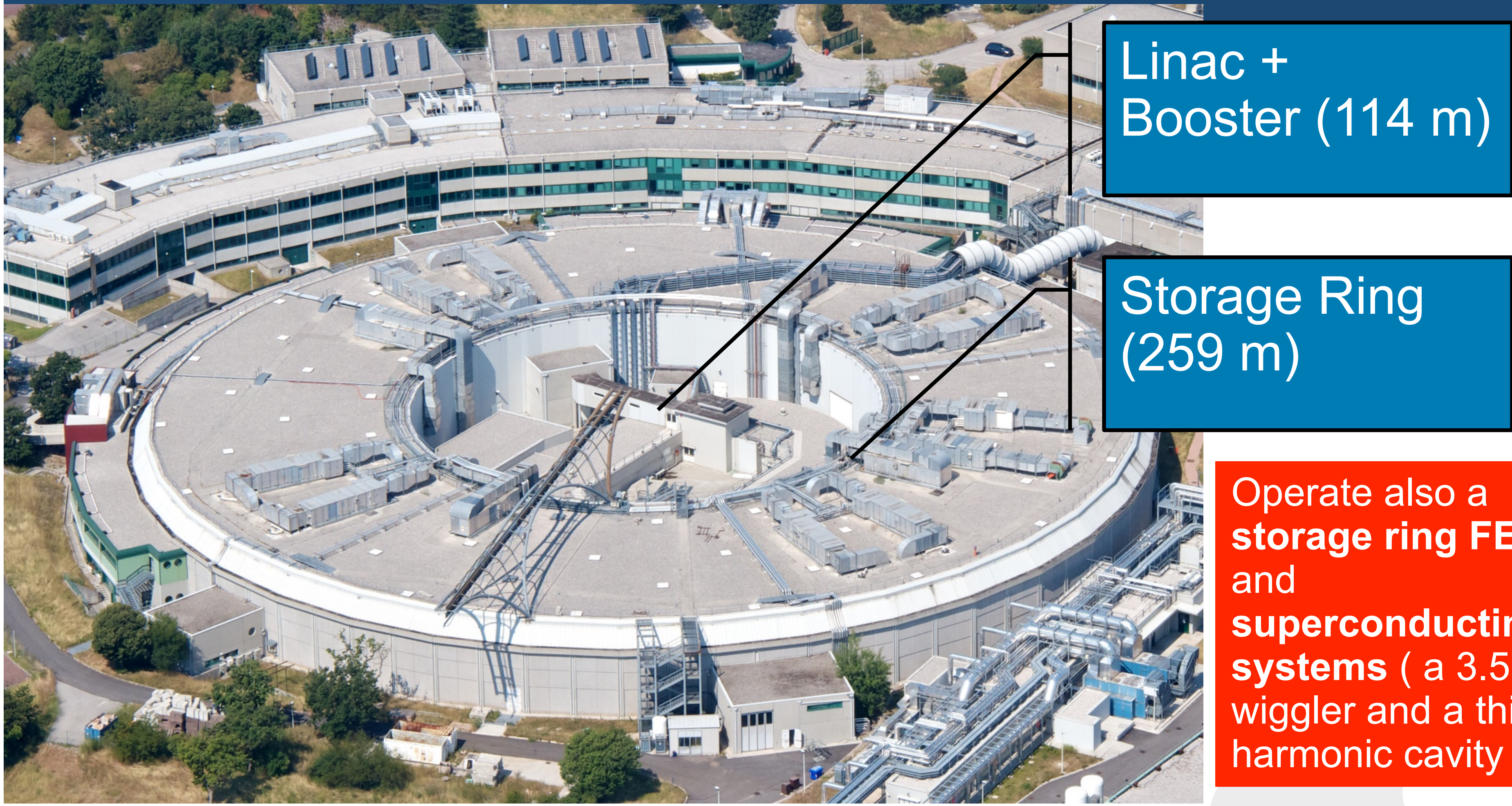
FERMI 1.5 GeV seeded Free Electron Laser Facility

Aerial view of Elettra during the construction

The picture was taken on May 14, 1992 by a Soviet spy satellite

Elettra

- Third generation light source, open to external users since 1994
- The machine complex initially made of a 1 GeV linac and a storage ring operating at 2.0 and since 1998 also at 2.4 GeV, in 2008 built a full energy injector (2.5 GeV booster plus 100 MeV linac) and since 2010 operates in **top-up mode**.



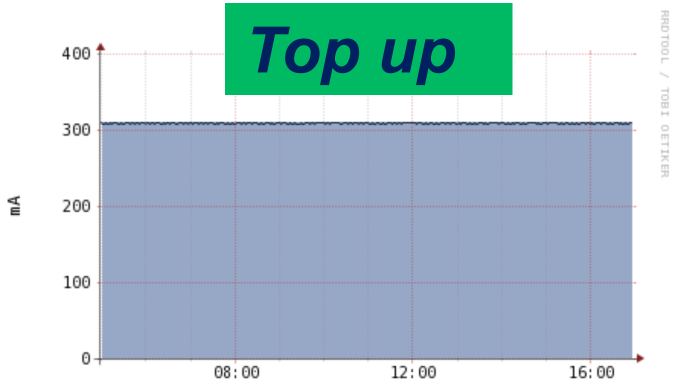
Operate also a **storage ring FEL** and **superconducting systems** (a 3.5 T wiggler and a third harmonic cavity)

Elettra in brief

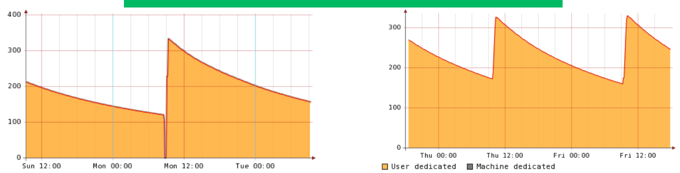
Operating modes for users:

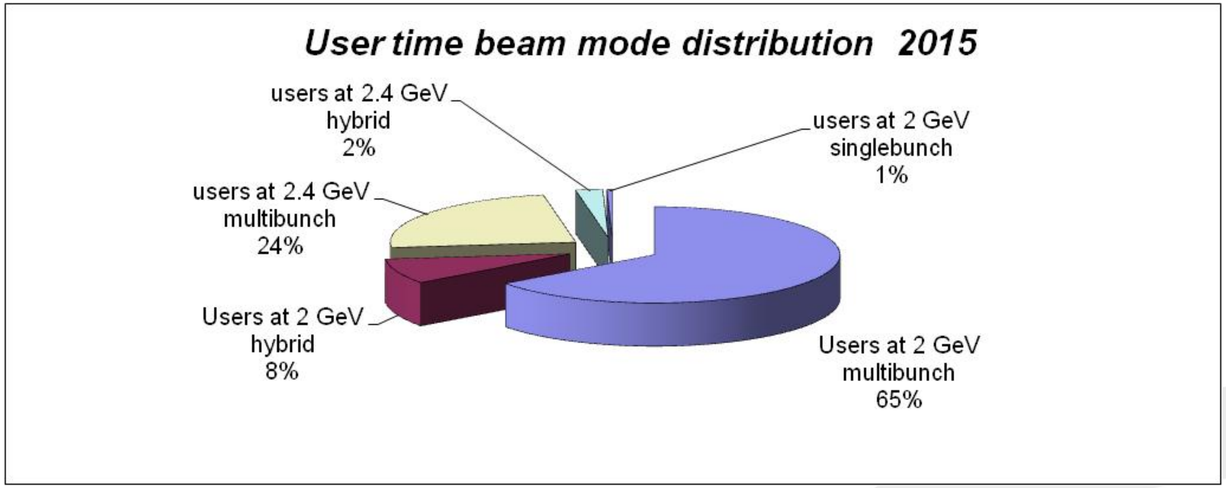
- Operates for 6400 hours per year (24h, 7/7), 5016 hours for users
- Top-up 2.0 GeV, 310 mA for 75 % of users time
- Top-up 2.4 GeV, 160 mA for 25 % of users time
- Filling patterns: multi-bunch 95 % filling or hybrid. Other filling patterns, as single bunch, few bunches or other multi-bunch fillings can be provided.
- 28 beam lines

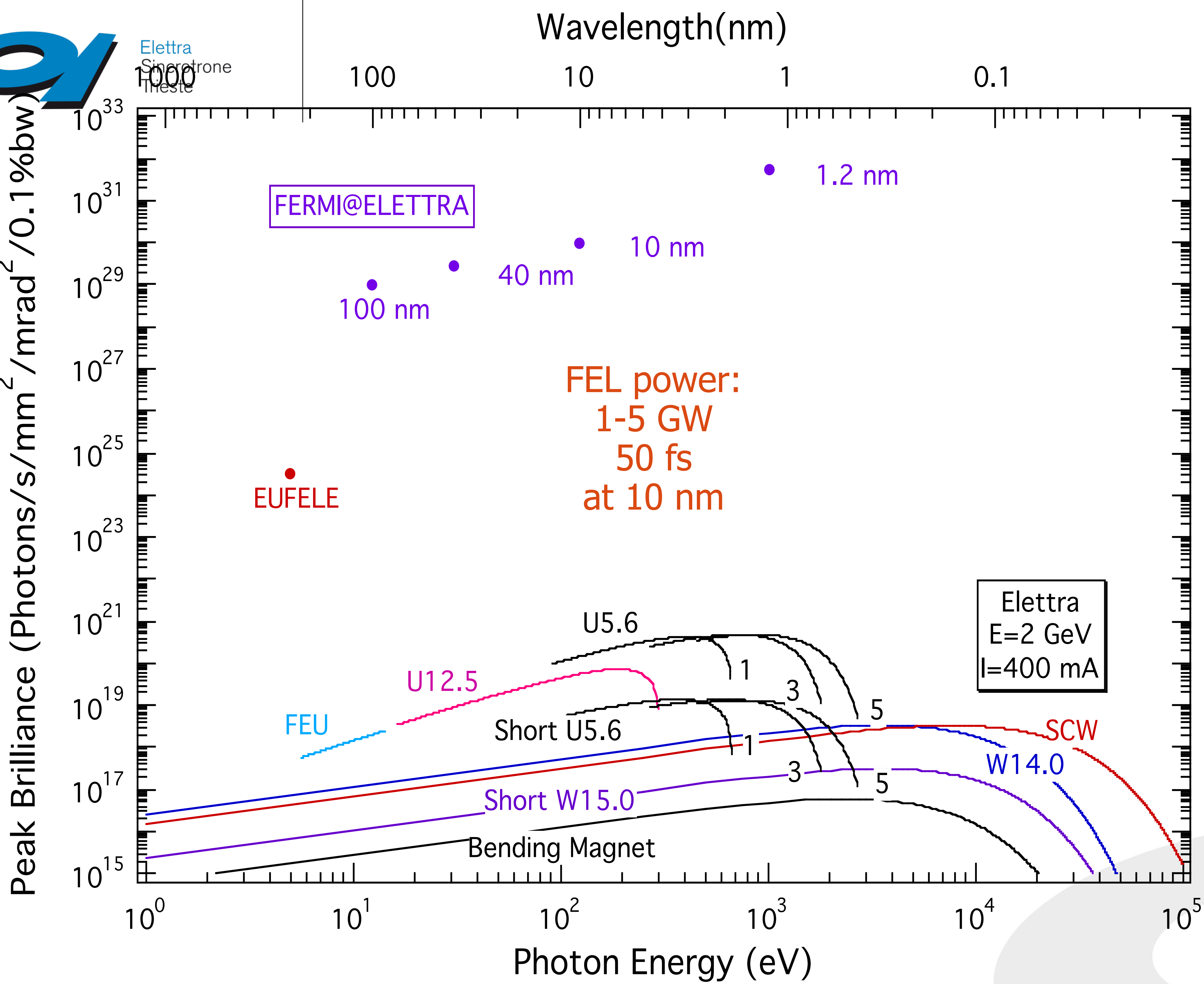
Top up



Decay mode







Wavelength(nm)
1000
100
10
1
0.1
FERMI@ELETTRA
1.2 nm
10 nm
40 nm
100 nm
FEL power:
1-5 GW
50 fs
at 10 nm
EUFELE
Elettra
E=2 GeV
I=400 mA
U5.6
U12.5
FEU
Short U5.6
SCW
W14.0
Short W15.0
Bending Magnet
Peak Brilliance (Photons/s/mm2/mrad2/0.1%bw)
Photon Energy (eV)

Elettra Sincrotrone Trieste

open

September 2016

Elettra

26 beamlines

in operation

major upgrades:

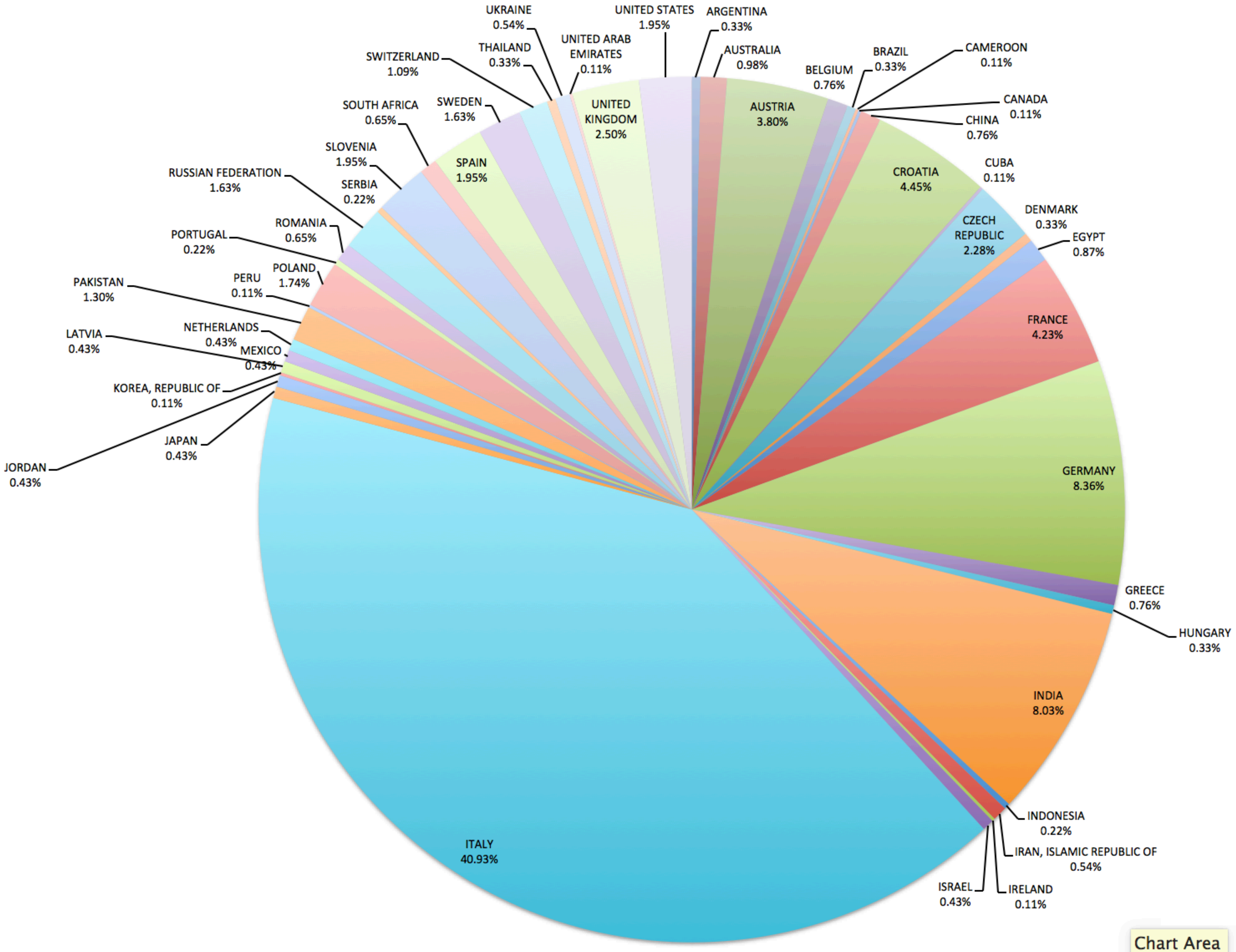
XRD1
SuperESCA
Nanospectroscopy

In operation in 2016

Xpress

under construction:
XRD2

921 Proposals received in 2015



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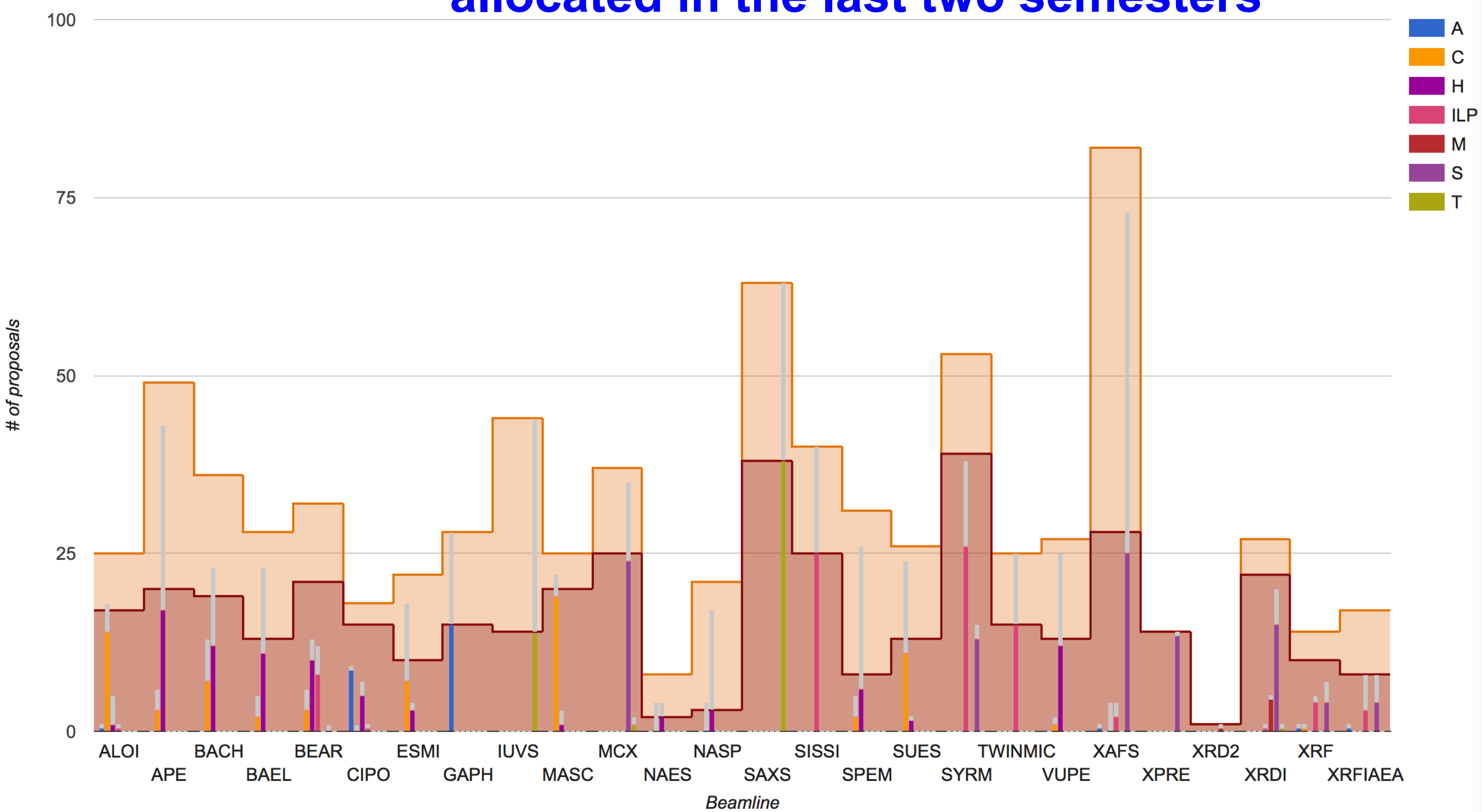
The "standard" Elettra BT distribution model

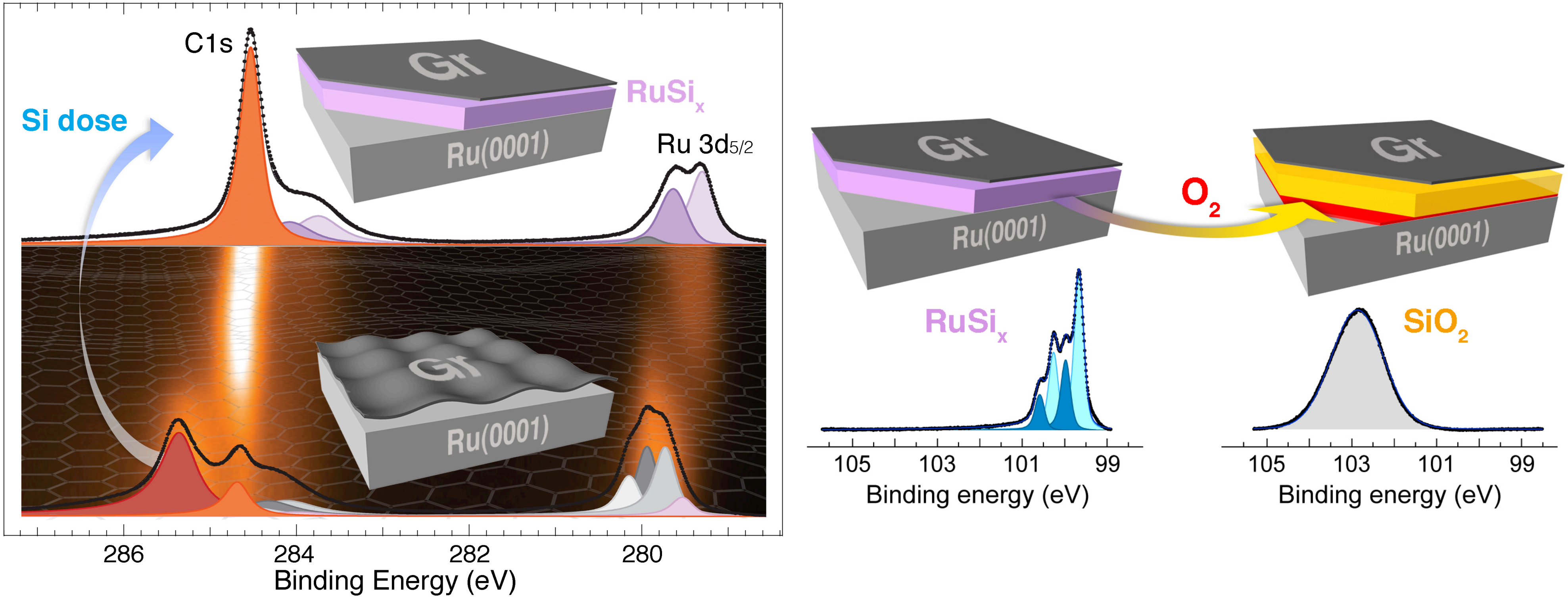
- The beamline group (Elettra+partners) gets 30% for maintenance and in-house research
- 70% is given on the basis of the Review panel priority list with corrections for specific agreements with partners
- Proprietary research BT is taken from the 30% and given back to the BL group in the subsequent semester (together with part of the revenue)

Proposals received vs. proposals allocated in the last two semesters



S=structures **ILP**=inst.&life sci.&polym. **T**=scattering **H**=E&M
A=atom.&mol.sci. **C**=catalysis&surf.sci. **M**=protein&macrom.

Electrically Insulated Epitaxial Graphene Fabrication



Step 1, (left): the exposure of graphene to silicon monitored in real time by X-ray photoemission spectroscopy. The silicon intercalates under the graphene and reacts with the of ruthenium support forming a thin silicide layer ($RuSi_x$).
Step 2, (right): the oxidation of the ruthenium silicide leads to the formation of a silicon dioxide film, as seen by the silicon photoemission spectra.

S. Lizzit *et al.*, Nano Letters 12, 4503 (2012); DOI: 10.1021/nl301614j; SuperESCA

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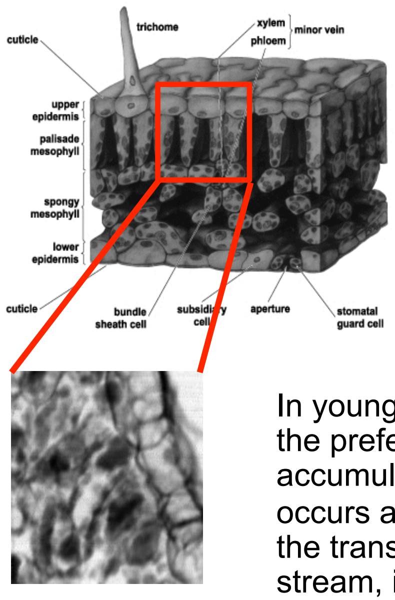
Biotechnology at Elettra

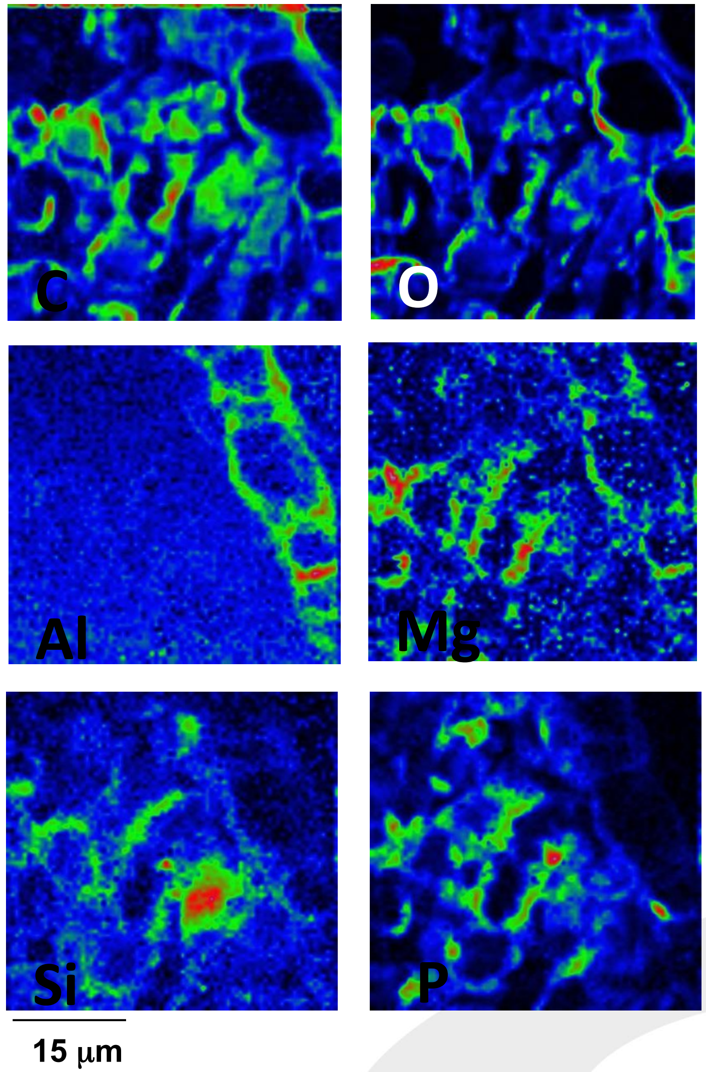
Nanotoxicoloy: localization of toxic metals in leaves
Aluminum localization in tea leaves

Cross-section of a leaf



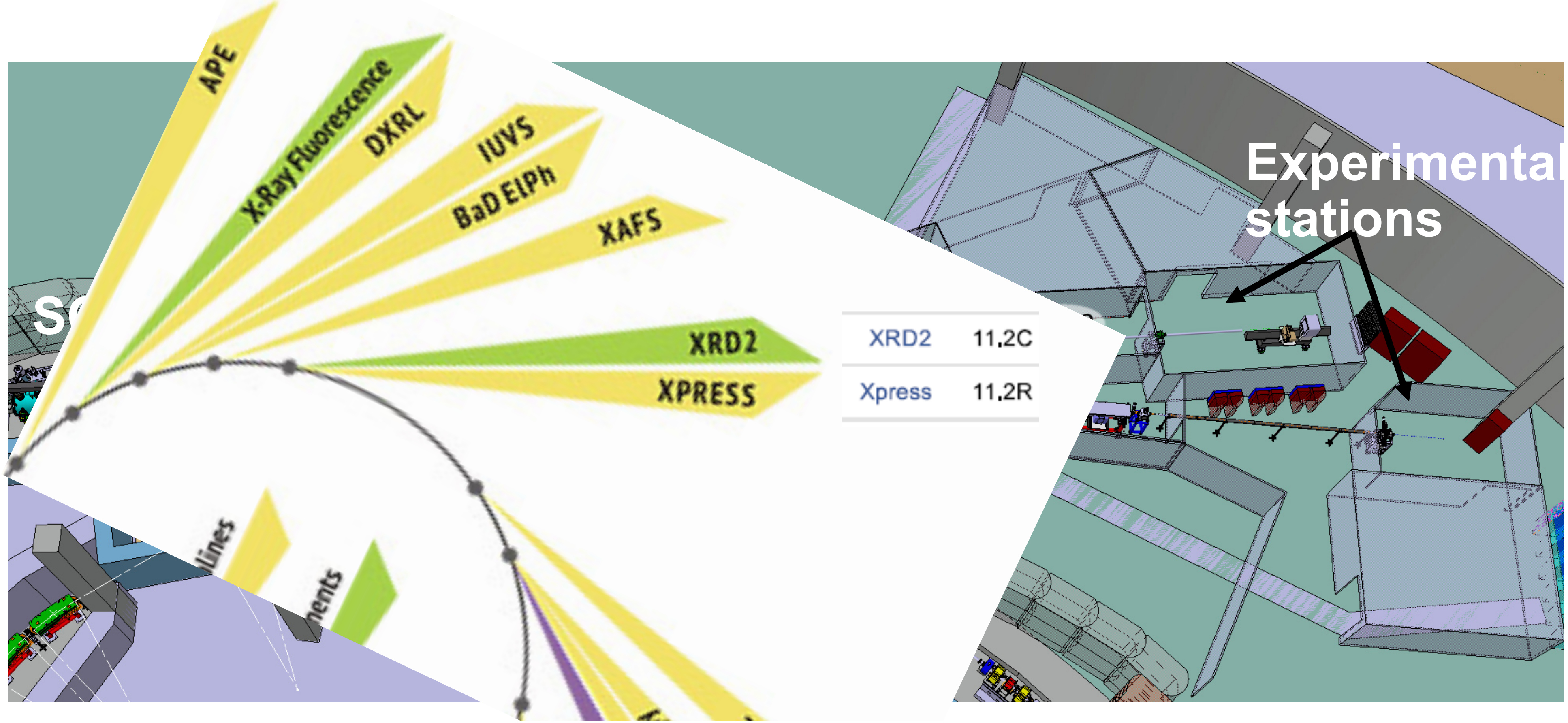
Functionality and toxicity of Al in tea leaves analysed at sub-cellular level (TwinMic Beamline, XRF)

In young tea leaves the preferential accumulation of Al occurs at the end of the transpiration stream, in the epidermal cell walls



R. Tolra *et al.,* J. Plant. Research **124**, 165 (2010)
TwinMic beamline

The SCW beamlines cluster



11.2 project :

scientific partnership between the India and Italy under a project administered through the Indian Institute of Sciences (IISc) Bengaluru, for the development of

a macromolecular and
a high pressure x-ray diffraction facilities

Xpress Source: Multipole Superconducting Wiggler

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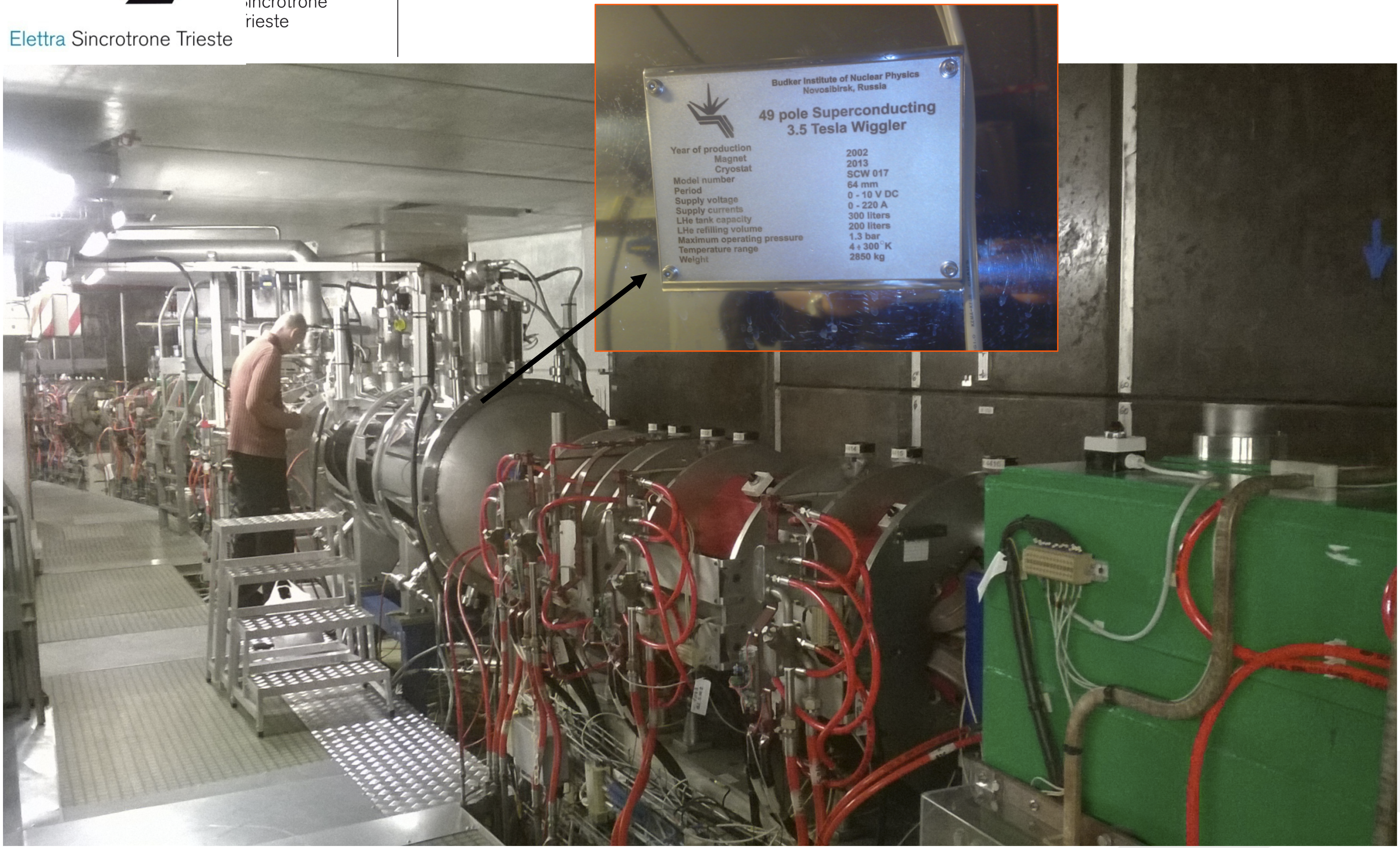

Source for 11.2 Beamlines-Superconducting Wiggler with 3.5T

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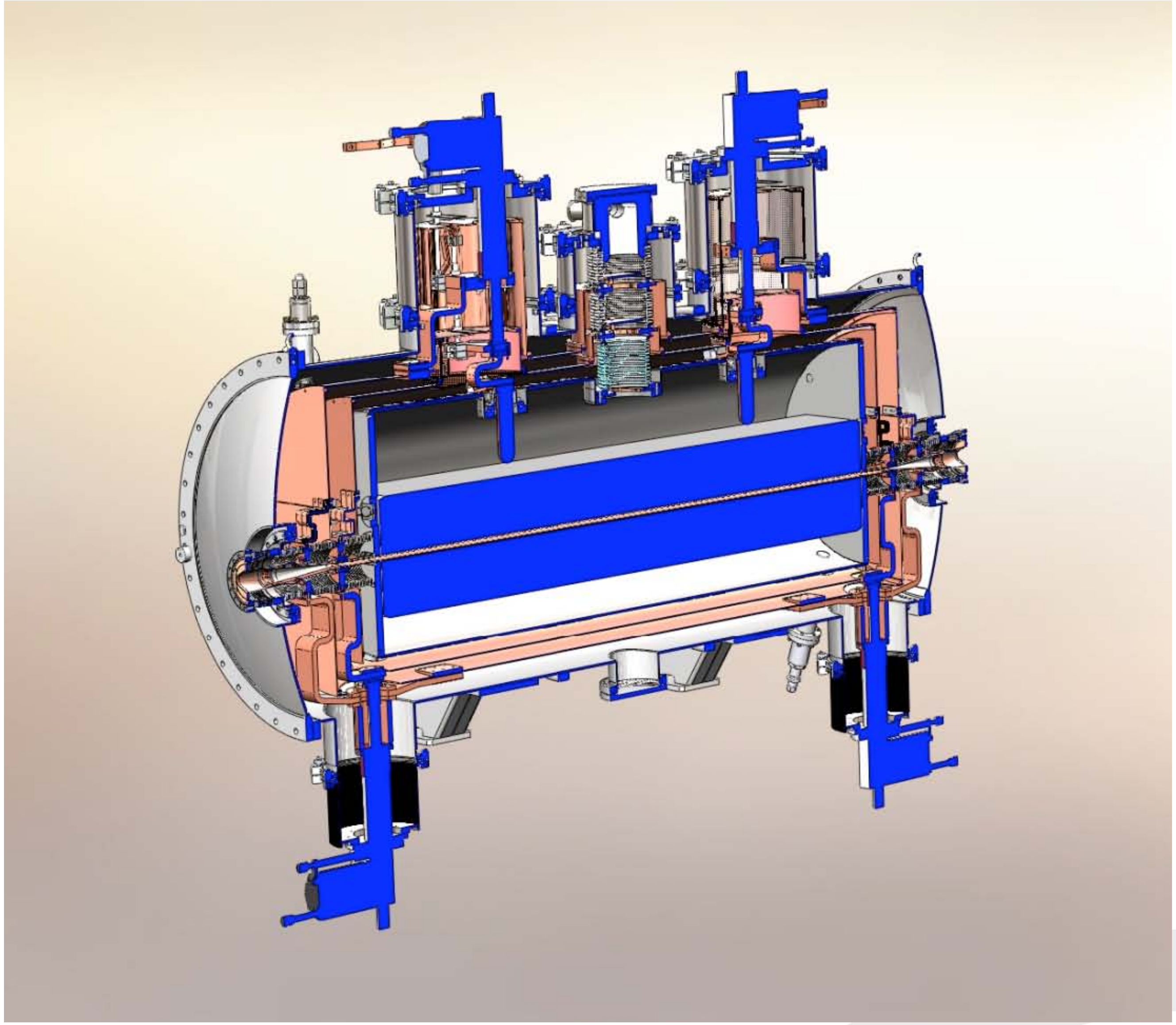
Multipole Superconducting Wiggler

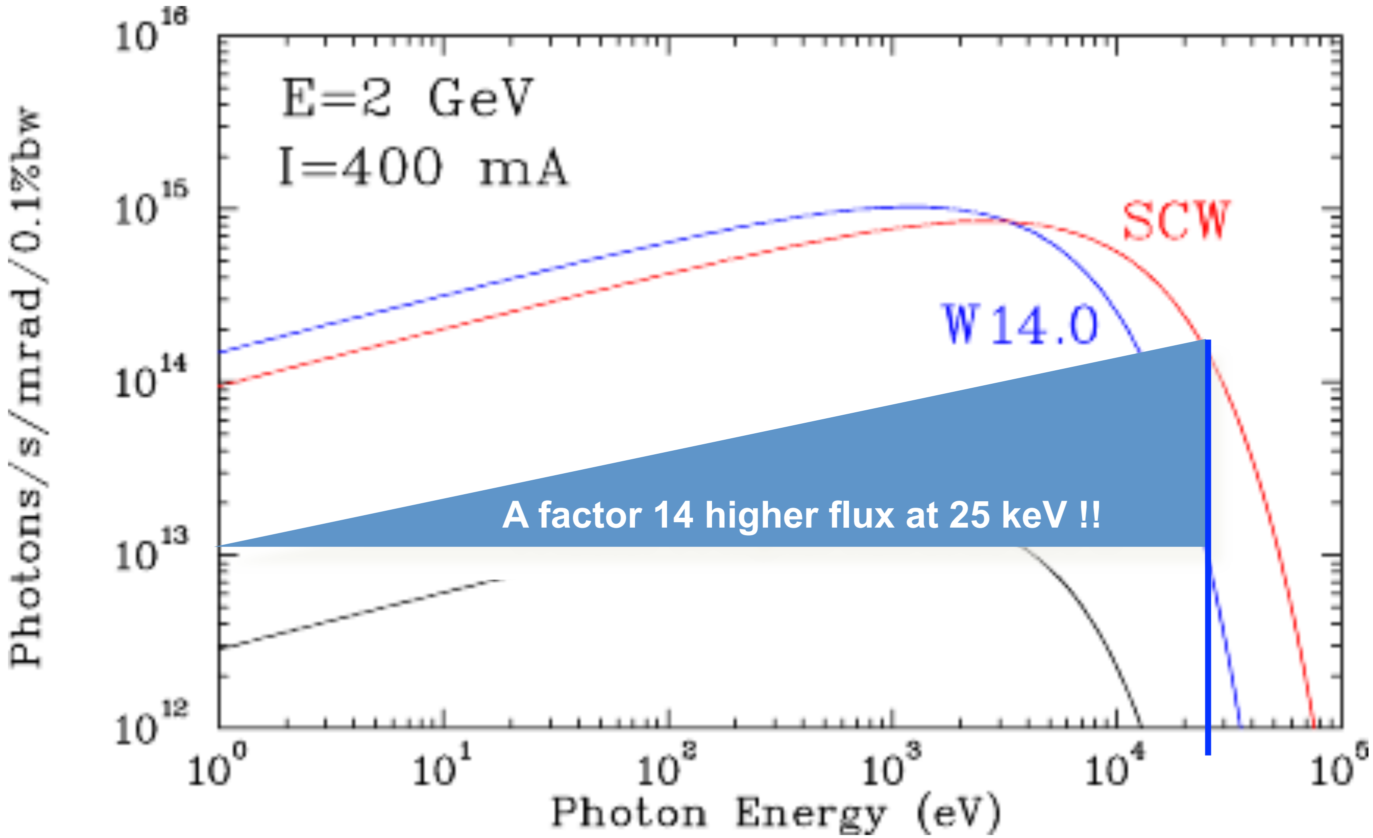
The multipole superconducting wiggler, constructed by Budker Institute of Novosibirsk, is designed to produce a high flux and brilliance source in the 10-25 keV range. Recently refurbished at Novosibirsk with new cryostat allowing to limit the liquid helium (LHe) consumption to a maximum of 2 refills per year

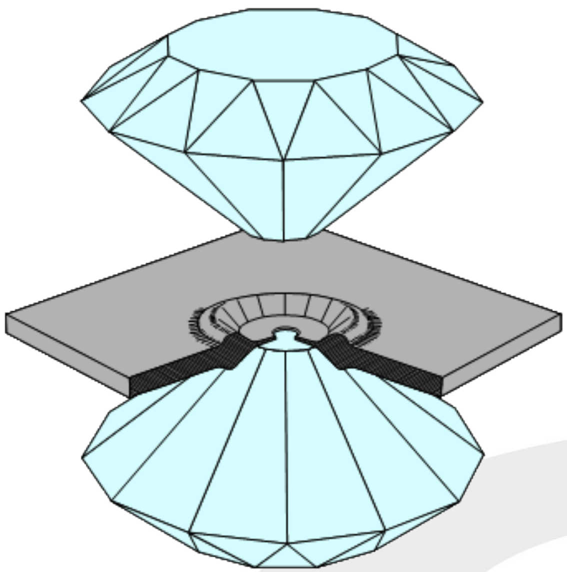


- Crytical photon energy 13.4 keV
- Total radiated power 19 kW
- Maximum field: 3.5 T
- Poles 49
- Pole gap 16.5 mm
- Period length 64 mm

Multipole Superconducting Wiggler

The new SCW compared to the permanent magnet wiggler of the existing Diffraction beamline (xrd1)



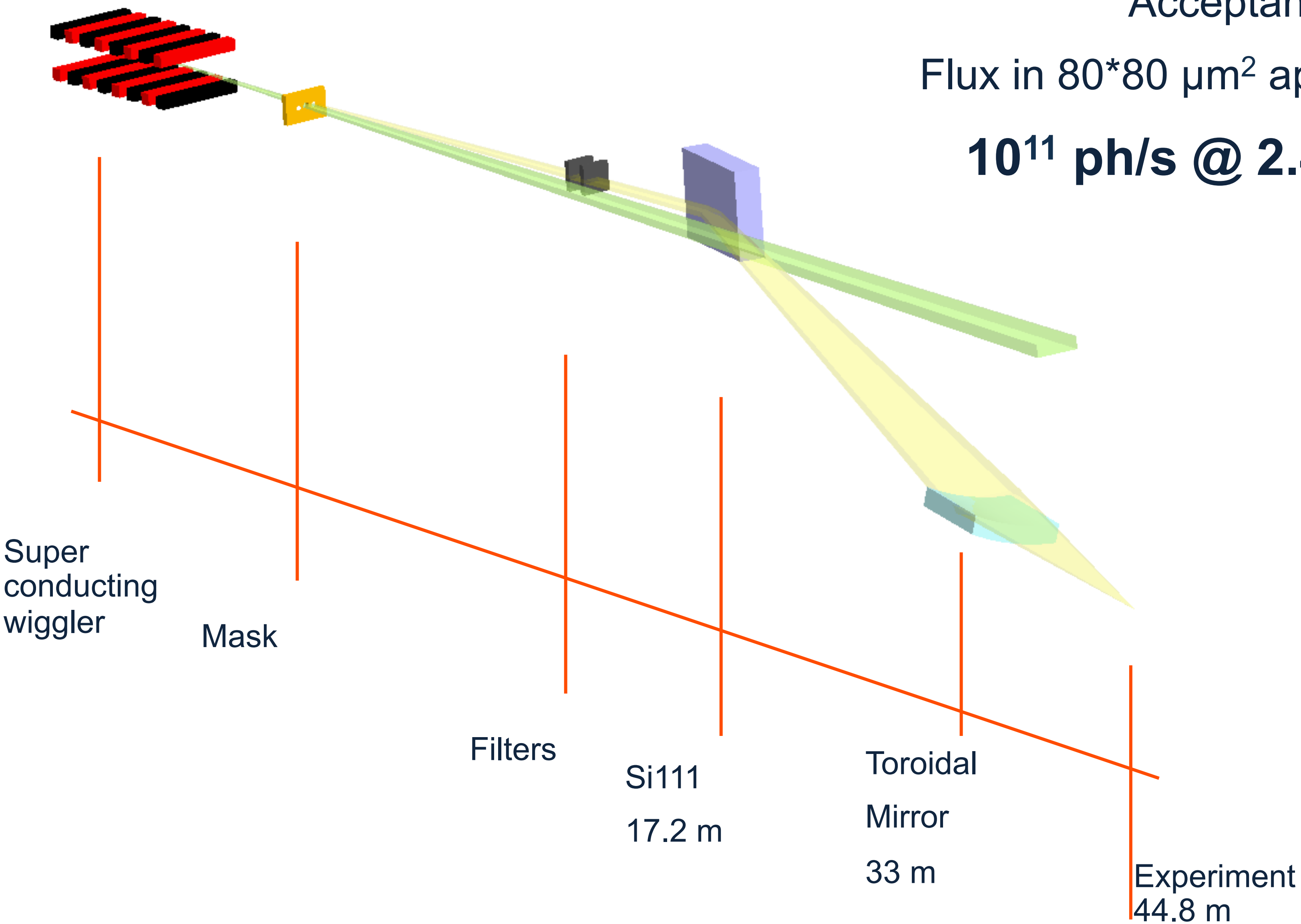


25 keV High Pressure branch-line

Acceptance 500*120 μrad²

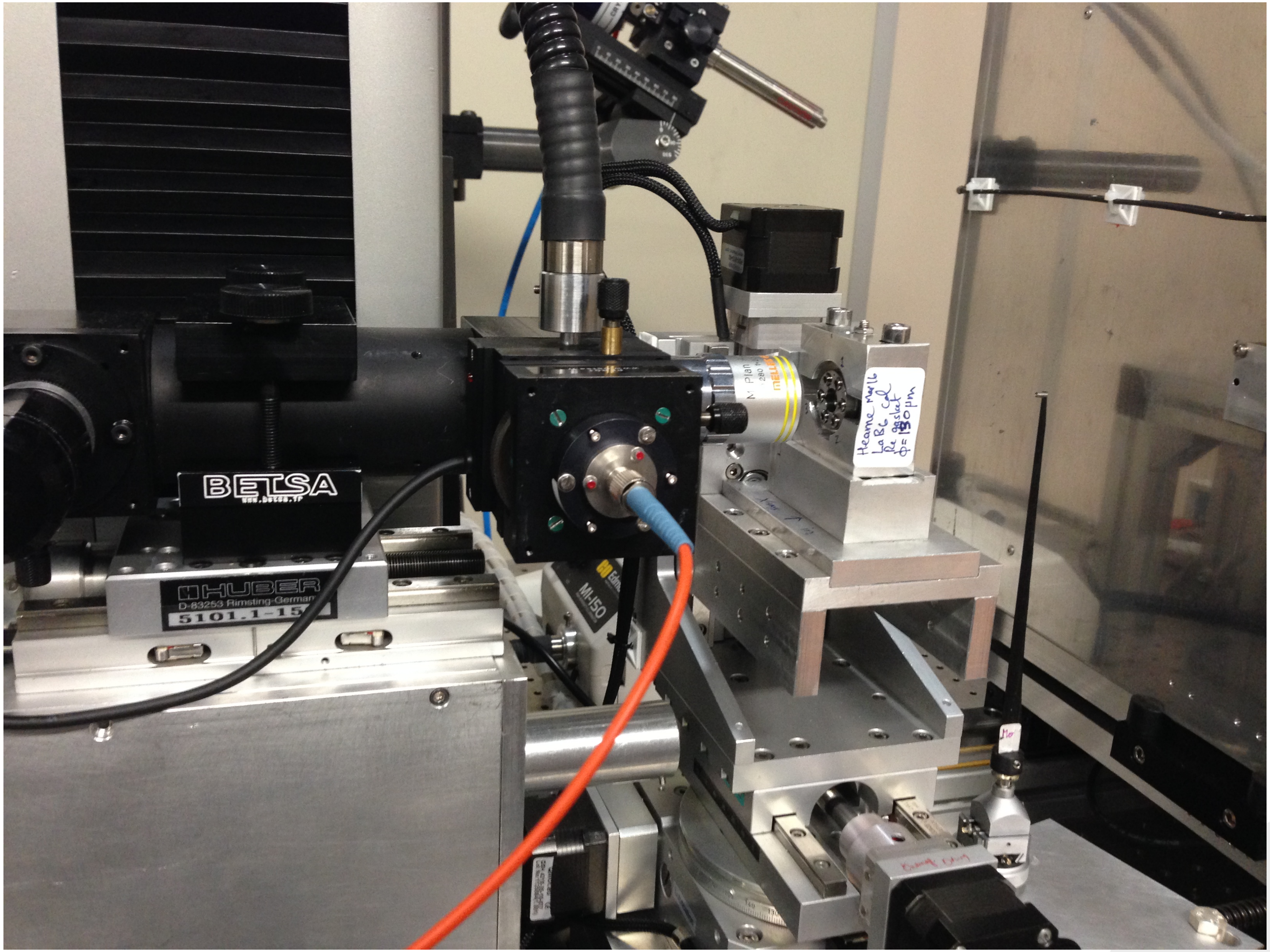
Flux in 80*80 μm² aperture at sample:

10^{11} ph/s @ 2.4 GeV, 100mA



XRD2 status

Xpress status



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ERIC: European Research Infrastructure Consortium

- A new legal framework, at EU level, to facilitate the joint establishment and operation of Research Infrastructures of European interest among several countries
- A legal body recognised in all EU Member States
- Current status: awarded ERICs:
  - ***SHARE*** *(17/03/2011, hosted by the Netherlands)*
  - ***CLARIN*** *(29/02/2012, hosted by the Netherlands)*
  - ***EATRIS*** *(11/11/2013, hosted by the Netherlands)*
  - ***BBMRI*** *(22/11/2013, hosted by Austria)*
  - ***European Social Survey*** *(22/11/13, hosted by the U.K.)*
  - ***ECRIN*** *(29/11/2013, hosted by France)*
  - ***Euro-Argo*** *(05/05/2014, hosted by France)*
  - ***CERIC*** *(28/06/2014, hosted by Italy)*
  - ***DARIAH*** *(15/08/2014, hosted by France)*
  - ***JIV*** *(12/12/2014, hosted by the Netherlands)*
  - ***ESS*** *(19/08/2015, hosted by Sweden)*
  - ***ICOS*** *(26/10/2015, hosted by Finland)*

CERIC-ERIC MEMBERS

The **Austrian facility** (RE: Graz University of Technology) is dedicated to the structural characterization of nanosystems with scattering techniques covering topics such as advanced materials, (bio-)polymers, proteins in solids, surfaces, liquids and in the gas phase. The facility provides access to its light and X-ray scattering laboratories, as well as to the Austrian SAXS beamline and Deep X-ray Lithography beamline, both at Elettra.

The **Croatian facility** (RE: Ruđer Bošković Institute) develops and allows access to ion beam techniques for materials' modification and characterization, such as PIXE and RBS, as well as a heavy ion microprobe, dual beam irradiation chamber with RBS/channeling, and TOF ERDA spectrometer.

The **Czech facility** (RE: Charles University Prague) has expertise in surface analysis, thin film growth and studies of the reaction mechanism on catalyst surfaces. It offers Photoelectron Spectroscopy (XPS, XPD, ARUPS) with Low Energy Ion Scattering Spectroscopy and LEED, Field Emission Gun Scanning Electron Microscope, Near Ambient Pressure XPS and access to the Materials Science Beamline at synchrotron Elettra dedicated to soft X-ray photoelectron spectroscopy and NEXAFS.

The **Hungarian facility** (RE: Budapest Neutron Centre) performs R&D in nuclear science and technology, studying the interaction of radiation with matter and doing isotope and nuclear chemistry, radiography and radiation chemistry, surface chemistry and catalysis (PGAA, NAA, RAD). Neutron scattering instruments allow investigation of microscopic properties of solids, liquids, soft materials, biological objects and condensed matter (PSD, SANS, TOF, GINA, MTEST, BIO, TAST).

The **Italian facility** (RE: Elettra Sincrotrone Trieste) covers a wide range of experimental techniques and scientific fields, including photoemission, spectromicroscopy, crystallography, dichroic absorption spectroscopy, x-ray imaging etc.

The **Polish facility** (RE: Polish Ministry of Science and Higher Education) offers techniques based on synchrotron radiation: the PEEM/XAS beamline (200-2000 eV photon energy range) is equipped with PEEM - Photoemission Electron Microscopy - and XAS, devoted to spectroscopy studies by absorption of soft X-rays. The UARPES undulator beamline (8-100 eV photon energy range) is equipped with the ARPES endstation, allowing precise studies on the structure of energy bands of solids and their surfaces.

The **Romanian facility** (RE: National Institute of Material Physics) has HRTEM and EPR laboratories for research in solid state physics and materials science, including the synthesis and characterization of advanced materials for applications in microelectronics, catalysis, energy industry and ICT.

The **Slovenian facility** (RE: National Institute of Chemistry) offers NMR spectroscopy for chemical analysis and identification, for determining 3D structures and studying the dynamics of small and larger bio-macro-molecules, for tracking chemical reactions in analytical and bioanalytical procedures, for studying polycrystallinity and identifying metabolites and various amorphous forms.

CERIC-ERIC AT WORK

- common entry point and integrated services for users
- single proposal evaluation system
- free and open access by quality selection only
- support and logistic services as required
- joint IPR and industrial policy
- joint educational and outreach activities

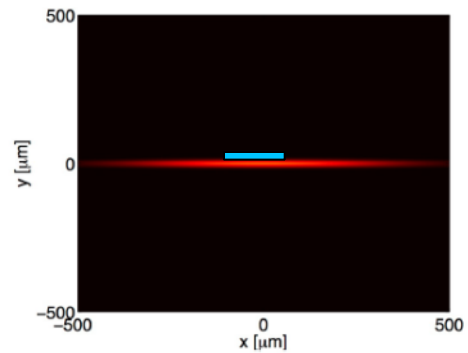
CERIC "call zero" received 30 proposals (1/3 accepted)
CERIC "call one" received 44 proposals (1/3 accepted)
CERIC "call two" received 55 proposals (1/3 accepted)

Elettra: Future

Elettra is very successful but is more than 20 years old and needs to evolve!

In the process of defining a successor to the machine, Elettra 2.0, based on latest trends in this field, i.e. next generation, ultimate light sources (ULS):

- Higher brilliance (more than one order of magnitude at lower photon energies, e.g. 1 keV),
- High level of coherence in both planes (3rd generation sources have only high vertical coherence),
- Smaller spot size and divergence,
- Higher flux and a variety of insertion devices.



However this implies

- long bunches
- Difficulties to have larger horizontal beam dimensions

Elettra 2.0 requirements

- The requirements for the new machine have been developed based on the interaction with the users' community and considering costs optimization.
- A dedicated workshop on the future of Elettra was held in April 2014 to examine the different scenarios

Design boundary conditions

Easier part

Beam energy: 2 GeV

Beam intensity: 500 mA

Emittance: to be reduced by more than 1 order of magnitude

Horizontal electron beam size: less than 60 μm

Conserve filling patterns: multibunch, hybrid, single bunch, few bunches

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Keep the same building and the same ring circumference (259-260 m)

Existing ID beam lines and their position should be maintained

Free space available for IDs: not less than that of Elettra

Keep the existing bending magnets beam lines

Use the existing injectors, that means off-axis injection

Tougher part

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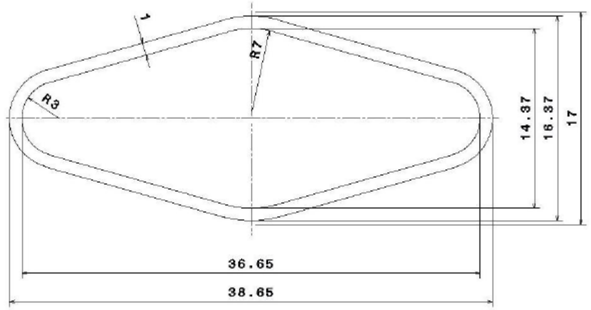
How it can be done

Increase the number of the dipoles and other magnets including their strength

Elettra	Elettra 2.0
Dipoles 24	Dipoles 72
Quadrupoles 108	Quadrupoles 216
Sestupoles 72	Sestupoles 240
Correttors 82+6 (x2)	Correttors 144 (x2)

Many more power supplies

Vacuum chambers with smaller transverse dimensions (halved)



Revision of the injection system

Use special wigglers for the dipole lines

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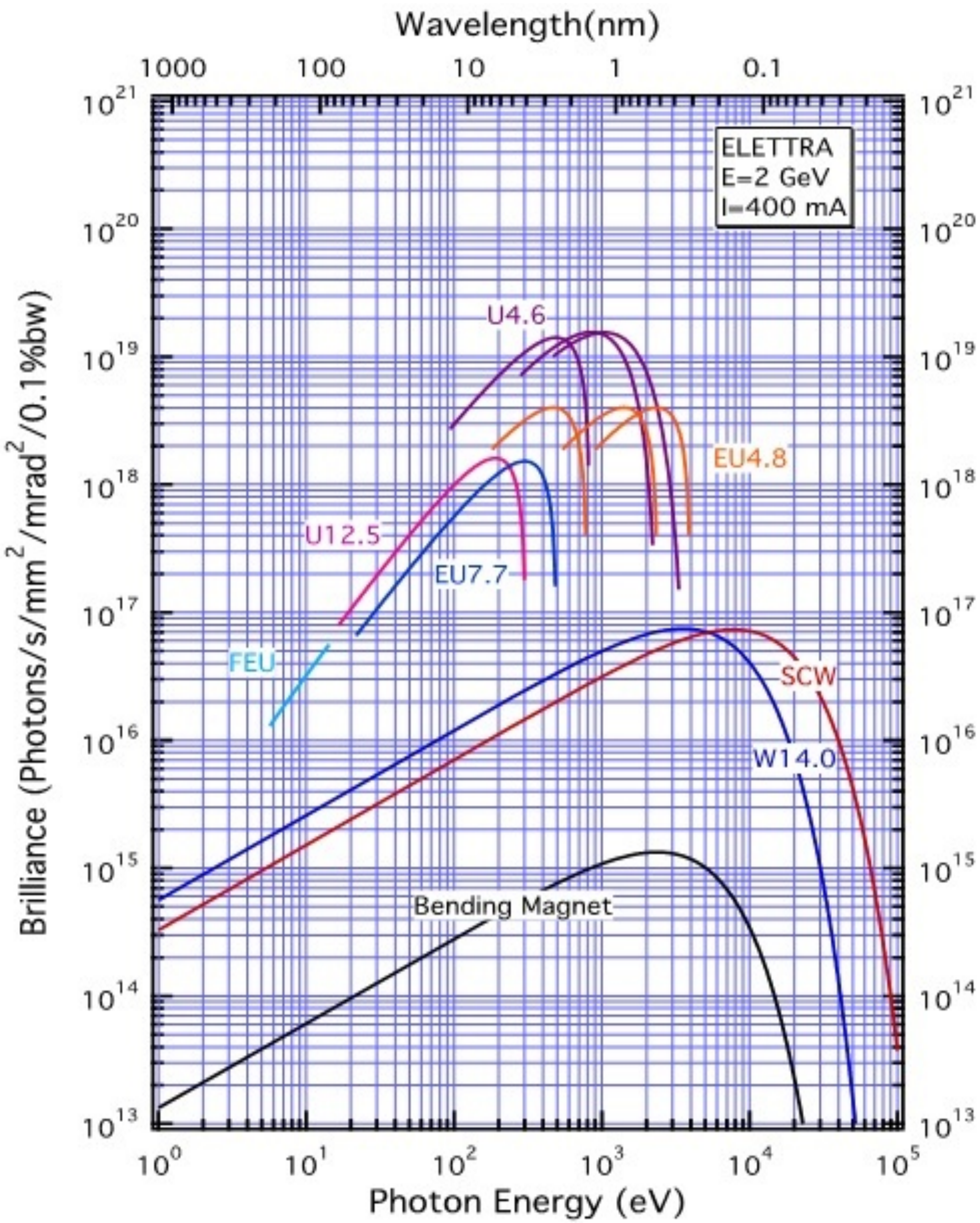
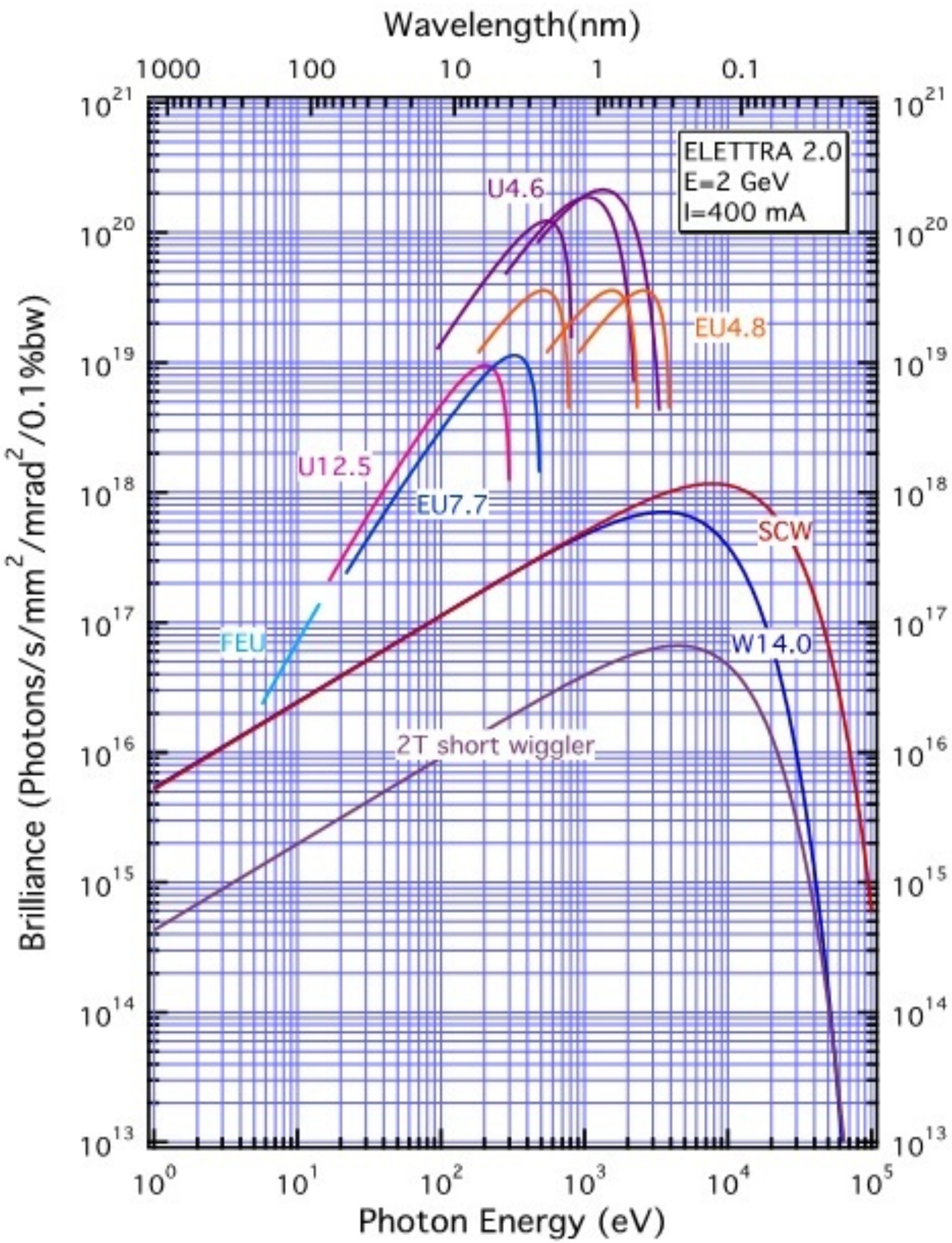
Elettra and Elettra 2.0

Parameter	Units	Elettra	Elettra2.0
Circumference	m	259.2	259.(5-8)
Energy	GeV	2 - 2.4	2
Horizontal emittance	pmrad	7000	230-280
Vertical emittance	pmrad	70 (1% coupl)	2.5
Beam size @ ID ($\sigma x, \sigma y$)	μm	245 , 14 (1% coupl)	43 , 3
Beam size at short ID	μm	350 , 22 (1% coupl)	45 , 3
Beam size @ Bend	μm	150, 28 (1% coupl)	17 , 7
Bunch length	ps	18 (100 with 3HC)	9 (70-100 with 3HC)
Energy spread	DE/E %	0.08	0.07
Bending angle	degree	15	5, 5.6 and 4.4
Coherence fraction @ 100 eV	%	22	87
Coherence fraction @ 1 keV	%	2	38

Brilliance



Wavelength(nm)
1000
100
10
1
0.1
ELETTRA
E=2 GeV
I=400 mA
U4.6
EU4.8
U12.5
EU7.7
FEU
SCW
W14.0
Bending Magnet
Brilliance (Photons/s/mm^2/mrad^2/0.1%bw)
Photon Energy (eV)



Wavelength(nm)
1000
100
10
1
0.1
ELETTRA 2.0
E=2 GeV
I=400 mA
U4.6
EU4.8
U12.5
EU7.7
FEU
SCW
W14.0
2T short wiggler
Brilliance (Photons/s/mm^2/mrad^2/0.1%bw)
Photon Energy (eV)

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Many Technological challenges.

The workshop, sponsored by CERN, will be very beneficial.

It also includes BESSY –VSR, ideas for round beams, 2GHz ring RF - systems etc.

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Advanced Low Emittance Rings Technology ALERT 2016

Advanced Low Emittance Rings Technology (ALERT) 2016 Workshop

14-16 September 2016
Trieste, Italy
Europe/Rome timezone

- Overview
- Scientific Programme
- Timetable
- Contribution List
- Registration
- Participant List
- Venue
- Accommodation

Trieste | 14-16 September 2016

A workshop on Advanced Low Emittance Rings Technology (ALERT 2016) is organized by ELETTRA on the 14th and 16th of September 2016, as a series of the Low Emittance Rings (LOWεRING) Workshops, supported by the EUCARD2 project.

This will be the 2nd workshop on Low Emittance Rings technology after the one organized in the 2014 in Valencia.

The state of the art in the design of accelerator systems in light source storage rings has today many challenges and issues in common with those of linear collider damping rings and future e+/e- circular collider projects. A series of workshops were made since 2010 aiming at strengthening the collaborations within the low emittance rings' community, including the LOWεRING collaboration network and the USR workshops community.

The goal of the ALERT2016 workshop is to bring together scientists but also industrial partners who are designing and building hardware for low emittance rings, with an emphasis on studies and experimental programs in existing rings and facilities. The impact of targeting and reaching ultra-low emittances to the design of technical systems will be addressed, including operational issues, manufacturing tolerances, calibration and stability/repeatability problems, in an environment dominated by synchrotron radiation.

With MAX IV in commissioning and ESRF II and Sirius in construction, this workshop will benefit from the technological solutions already tested at these labs and important lessons could be learned.

Workshop sessions will include:

- Insertion devices (including also superconducting devices)
- Magnets and alignment
- Injection systems (kickers, multipoles etc)
- RF systems, choices and design
- Vacuum systems and vacuum chambers
- Feedback systems
- Instrumentation

Proposals for contributions to the workshop should be addressed to one of the Scientific Committee members

Elettra 2.0-2.4 GeV 3rd generation Synchrotron Radiation Facility

FERMI 1.5 GeV seeded Free Electron Laser Facility

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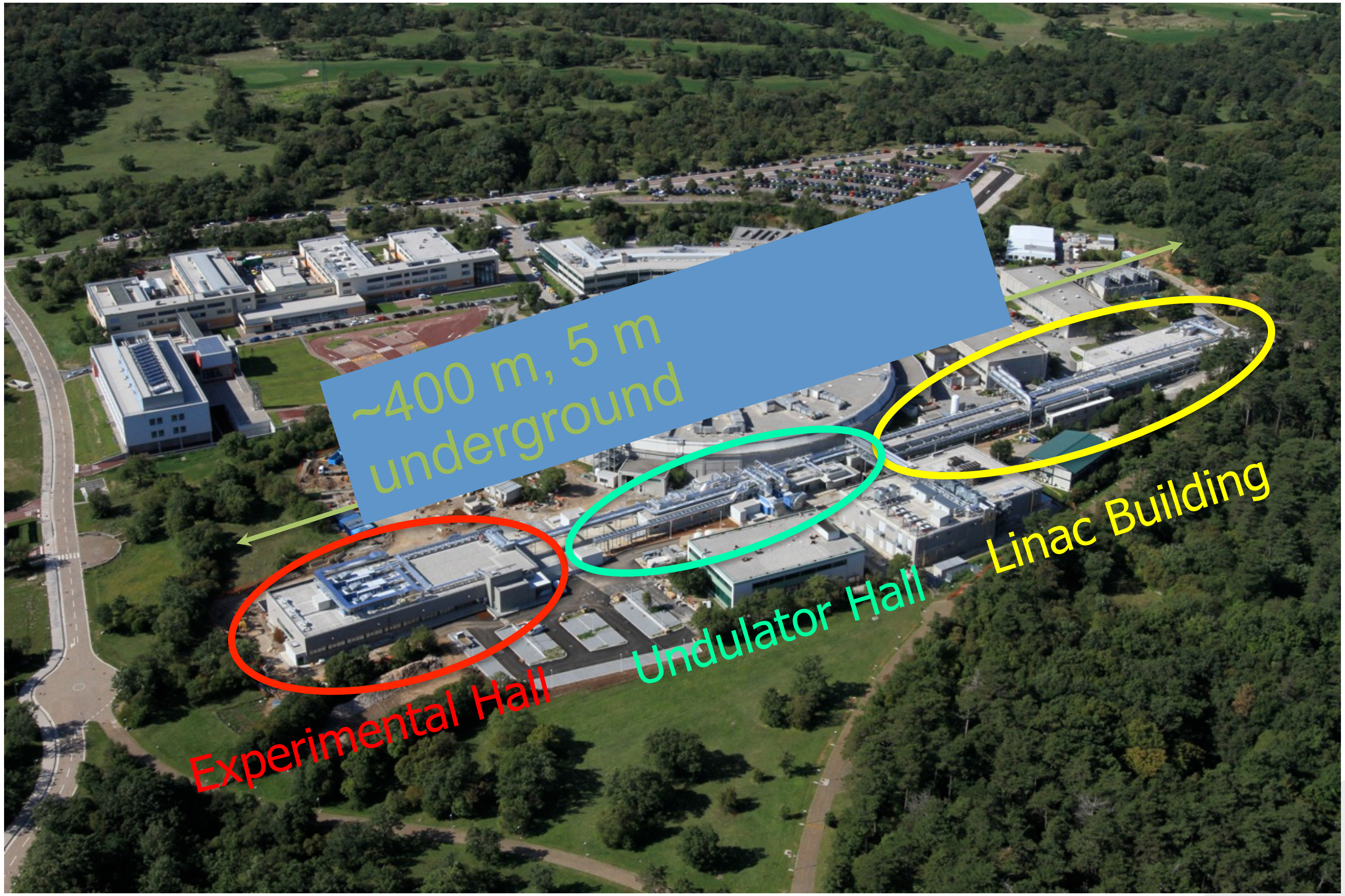
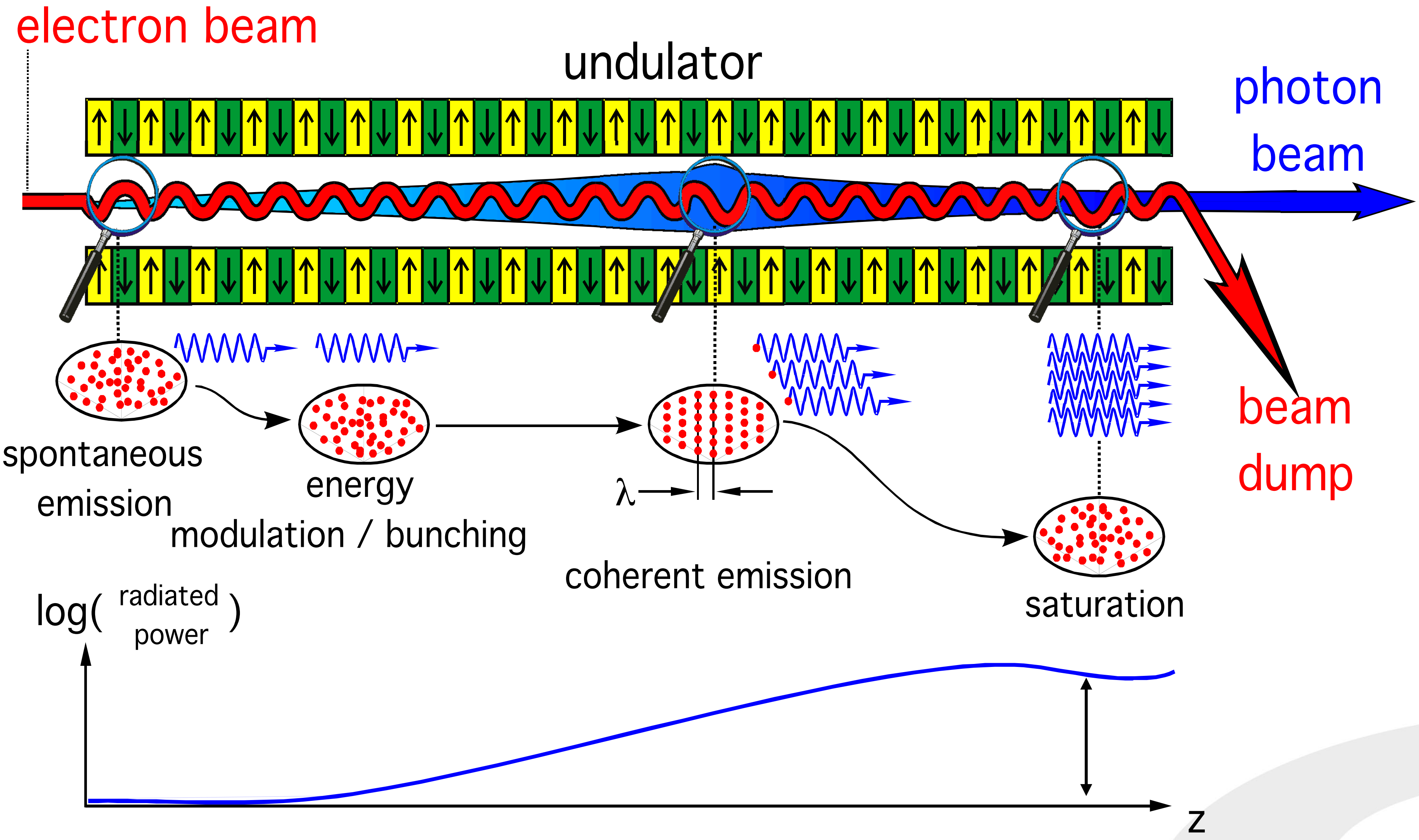
FERMI@Elettra

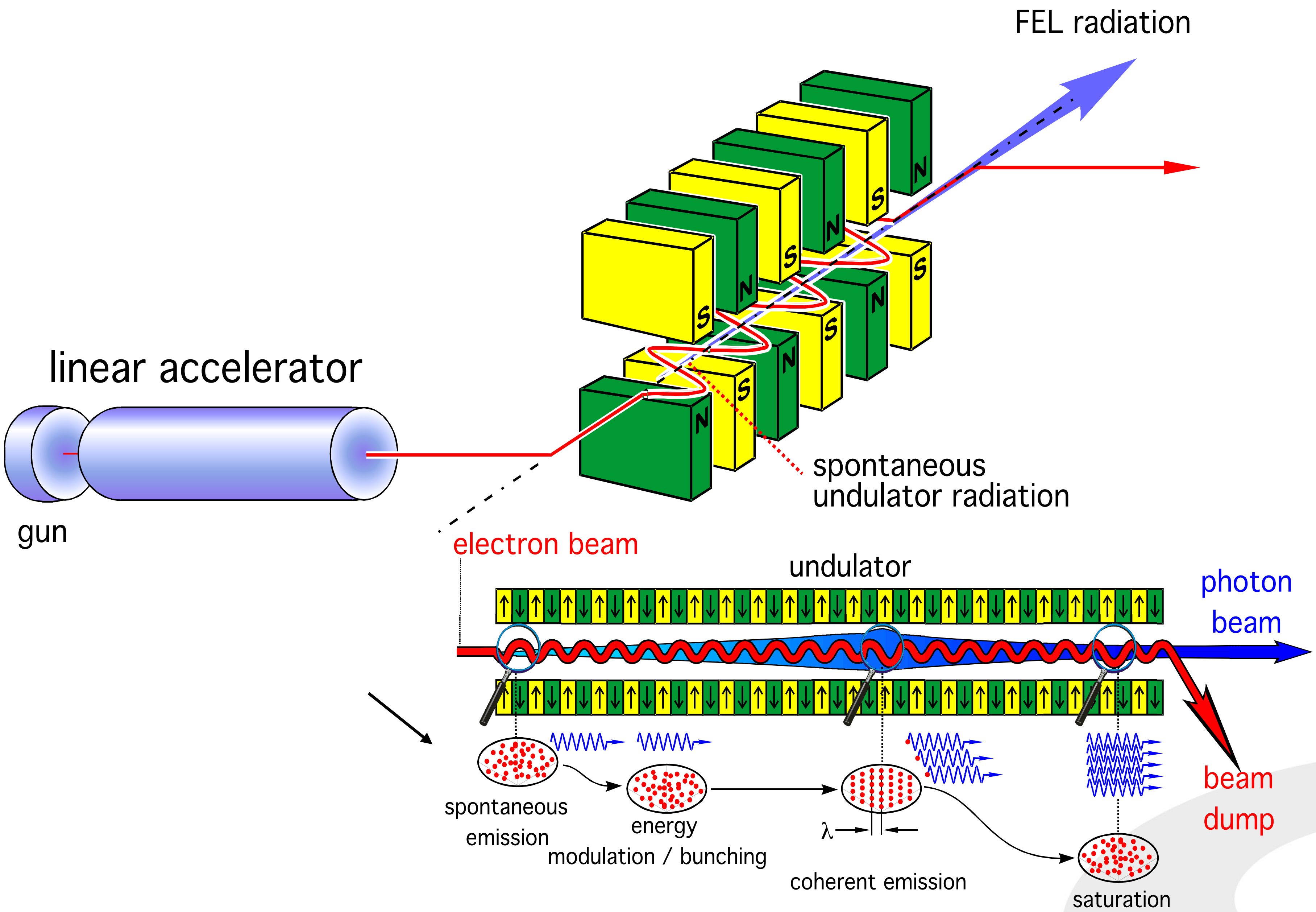
Overall length of underground part (5 m below ground): ~ 400 m
Three main parts: Linac & Klystron Hall; Undulator Hall; Experimental Hall



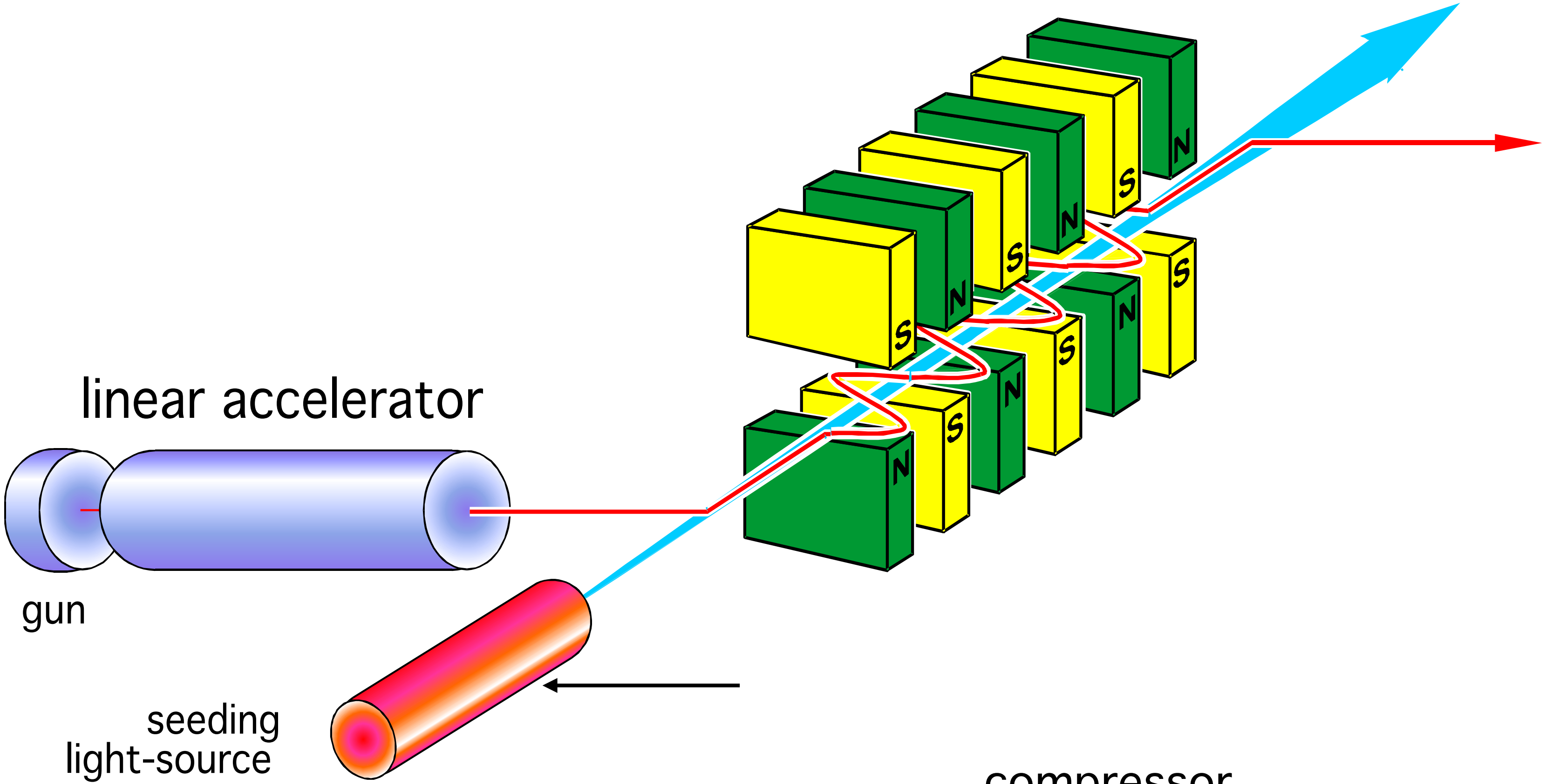
SASE FEL


electron beam
undulator
photon
beam
beam
dump
spontaneous
emission
energy
modulation / bunching
λ
coherent emission
saturation
log(radiated power)
z

SASE FEL


FEL radiation
linear accelerator
gun
spontaneous
undulator radiation
electron beam
undulator
photon
beam
beam
dump
spontaneous
emission
energy
modulation / bunching
λ
coherent emission
saturation

Seeded FEL


amplified radiation
linear accelerator
gun
seeding
light-source
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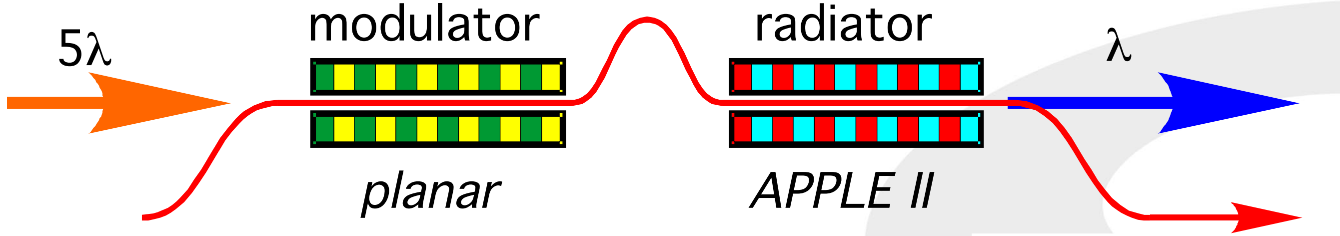
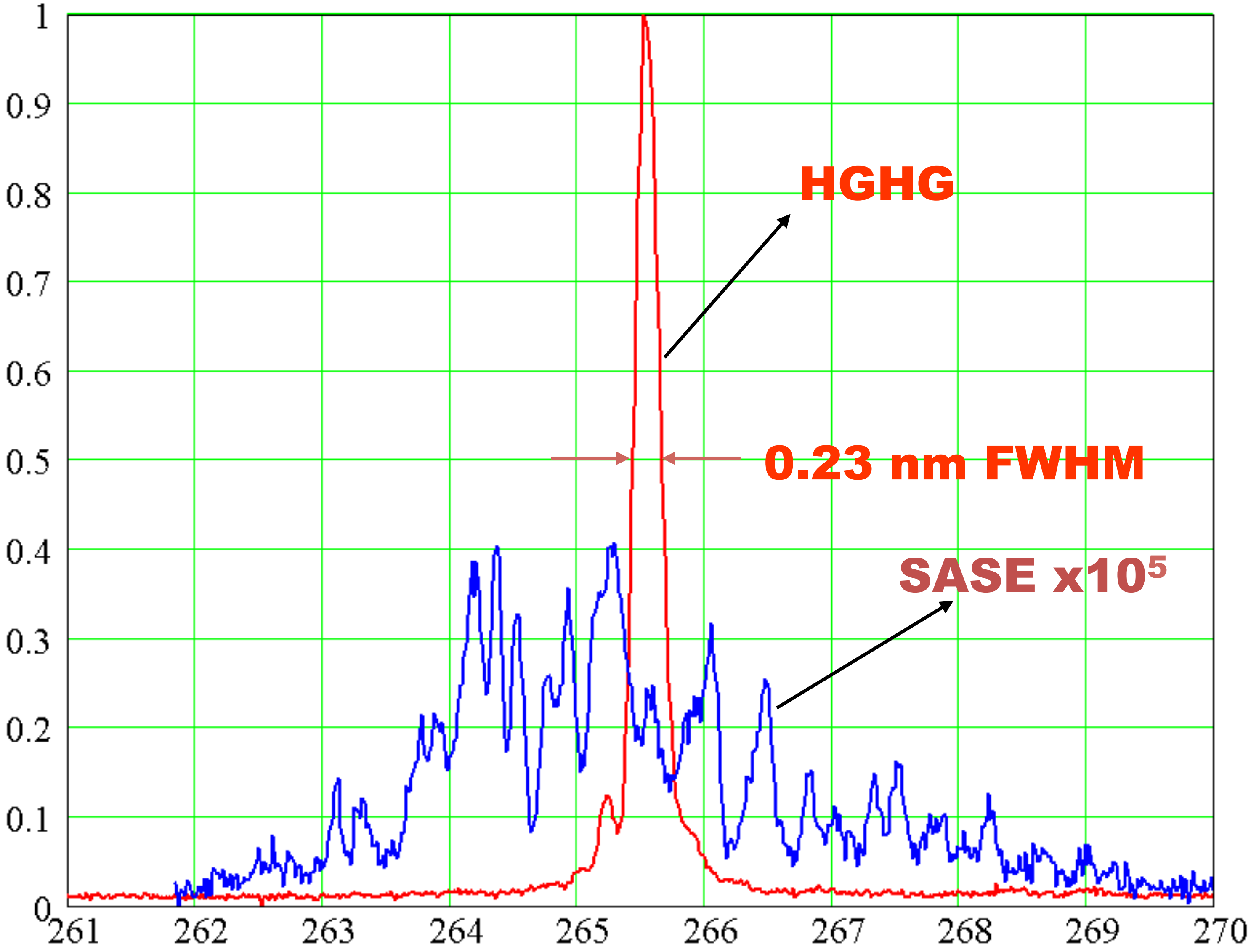

compressor
seed laser
5λ
modulator
radiator
HGHG
λ
planar
APPLE II
e-beam

Seeded FEL



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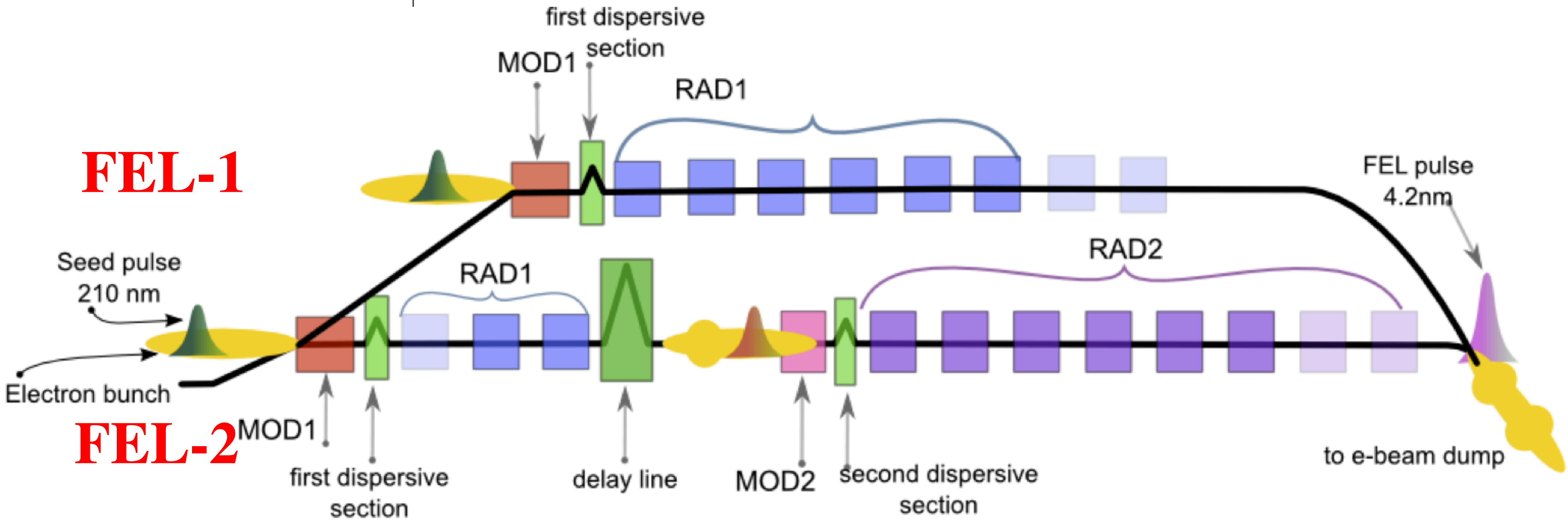

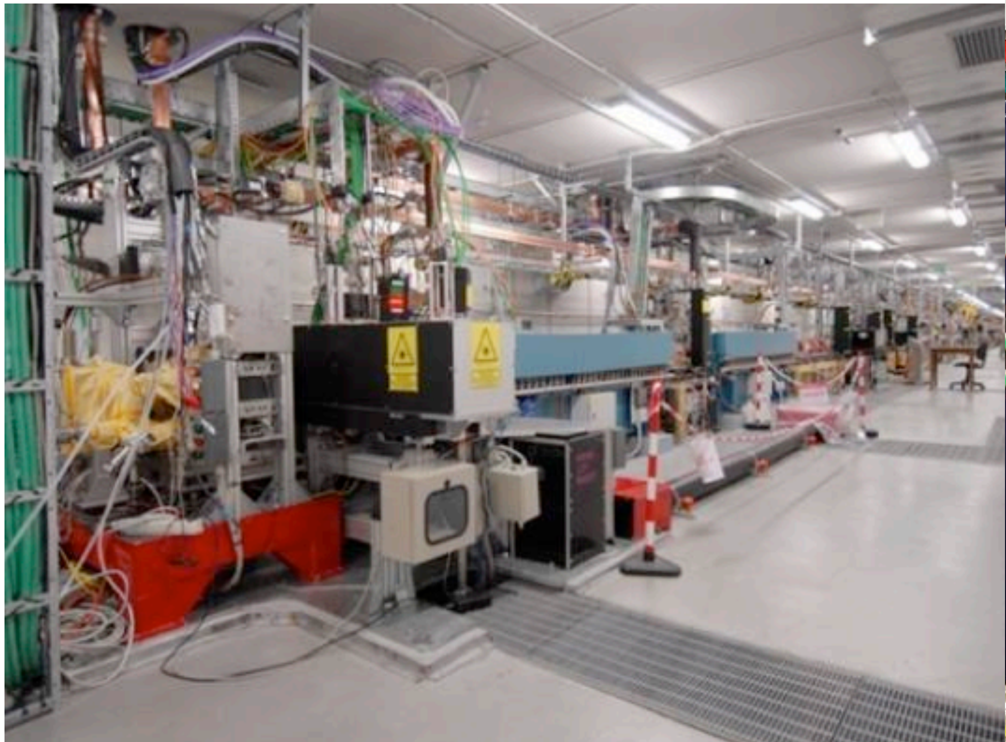

nature photonics

ARTICLES

PUBLISHED ONLINE: 23 SEPTEMBER 2012 | DOI: 10.1038/NPHOTON.2012.233

Highly coherent and stable pulses from the FERMI seeded free-electron laser in the extreme ultraviolet

nature photonics

ARTICLES

PUBLISHED ONLINE: 20 OCTOBER 2013 | DOI: 10.1038/NPHOTON.2013.277

Two-stage seeded soft-X-ray free-electron laser

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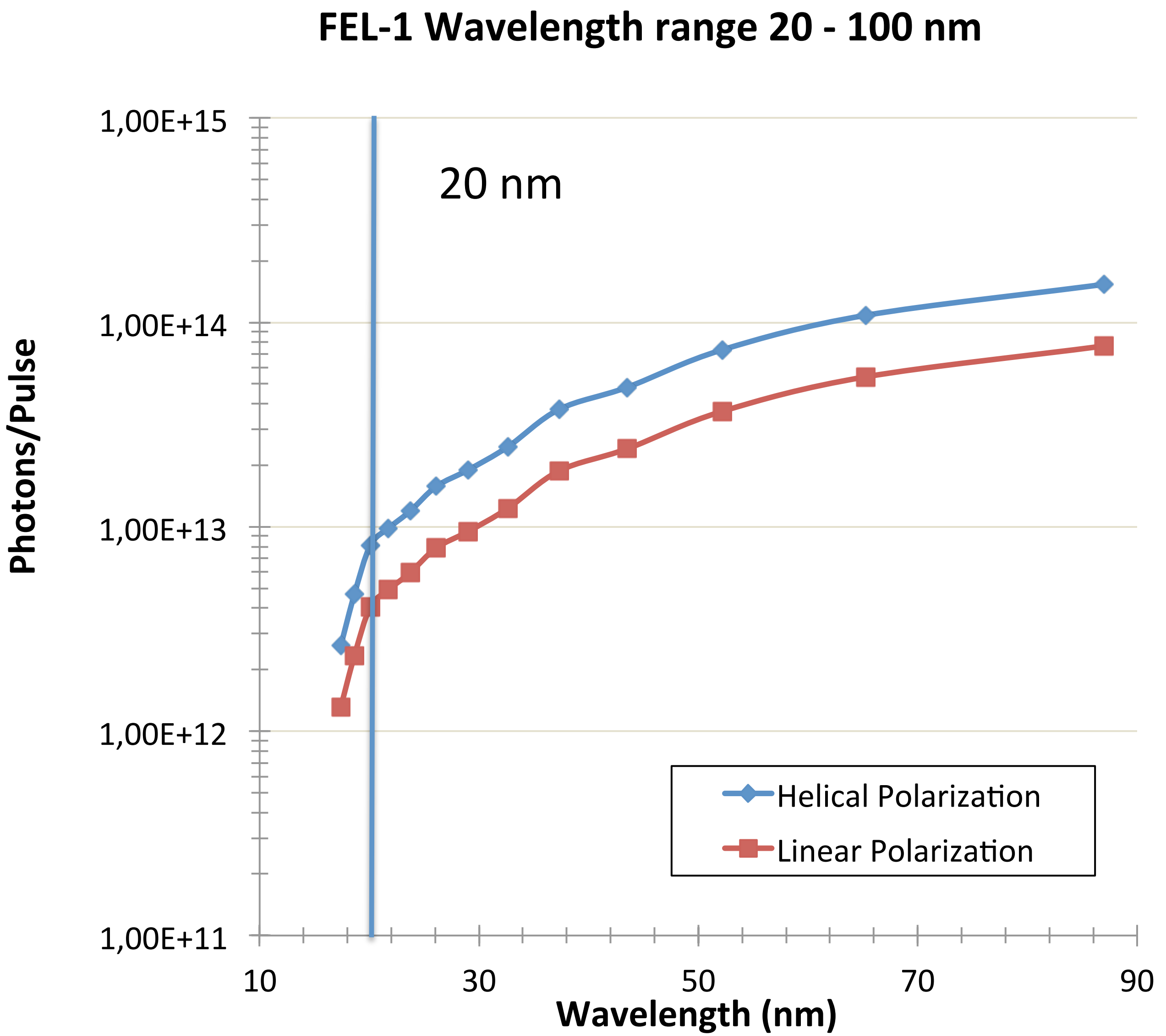
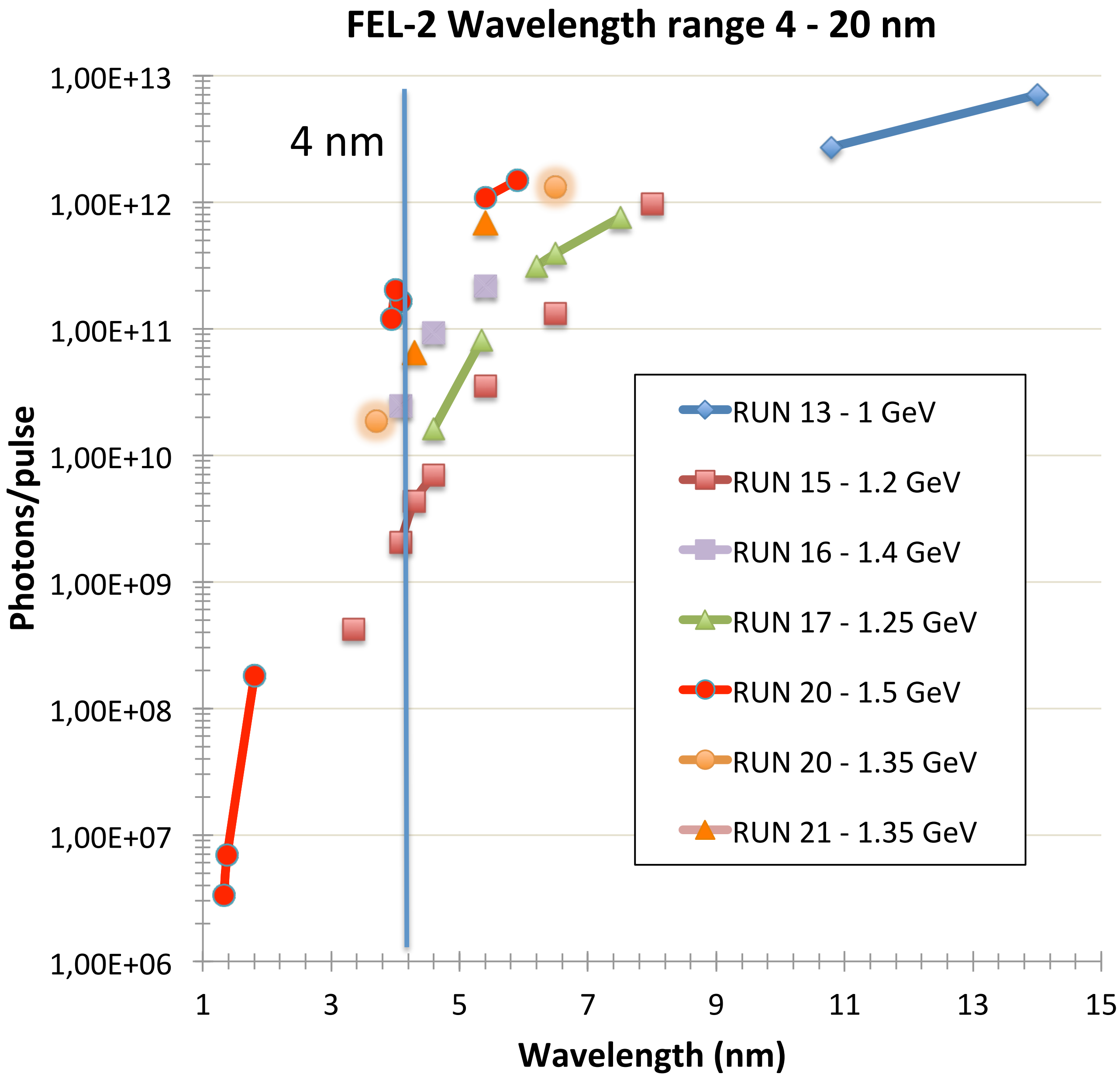
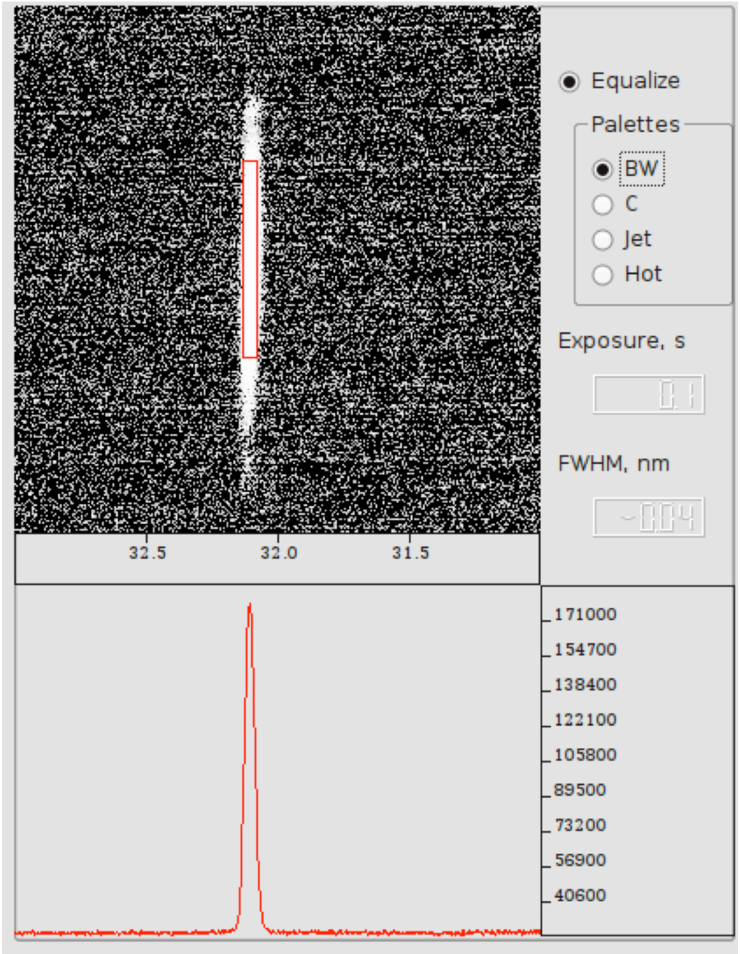
FEL-1: Photons/Pulse
(achieved - average)

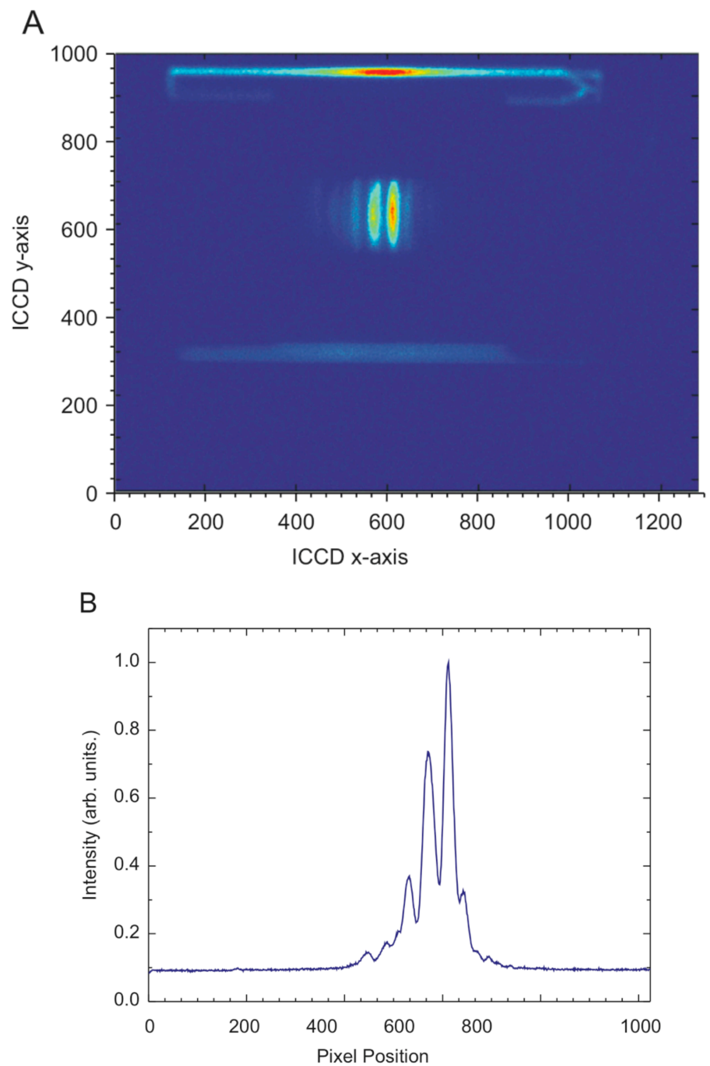


FEL-2 – Photons/Pulse achieved (average) Helical Polarization



26.4 nm





Spectral lines as measured at FERMI@Elettra (left panel) and at the FLASH SASE facility in Hamburg, Germany (right panel).

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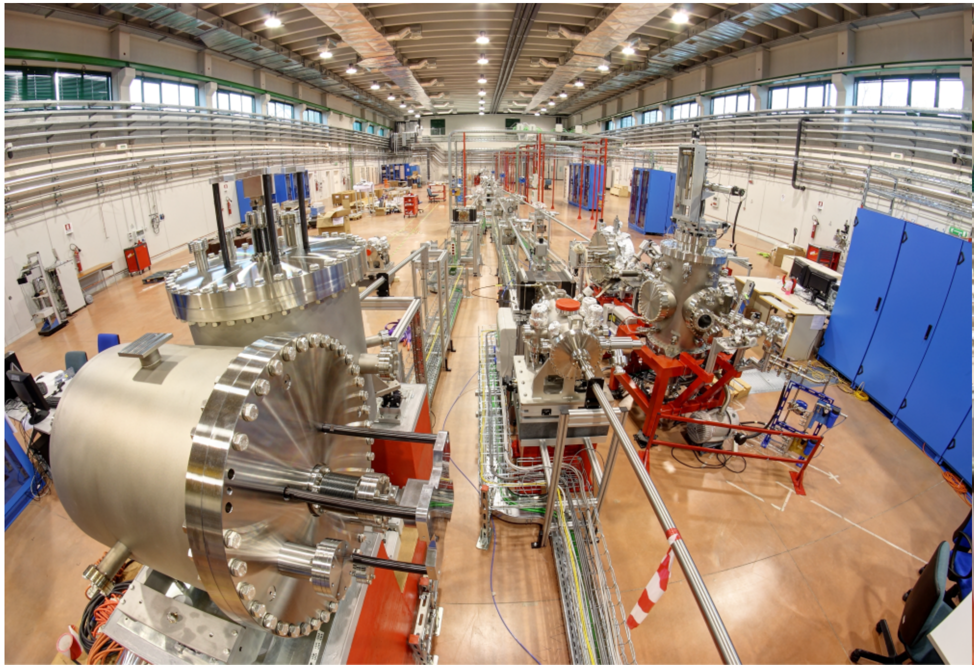
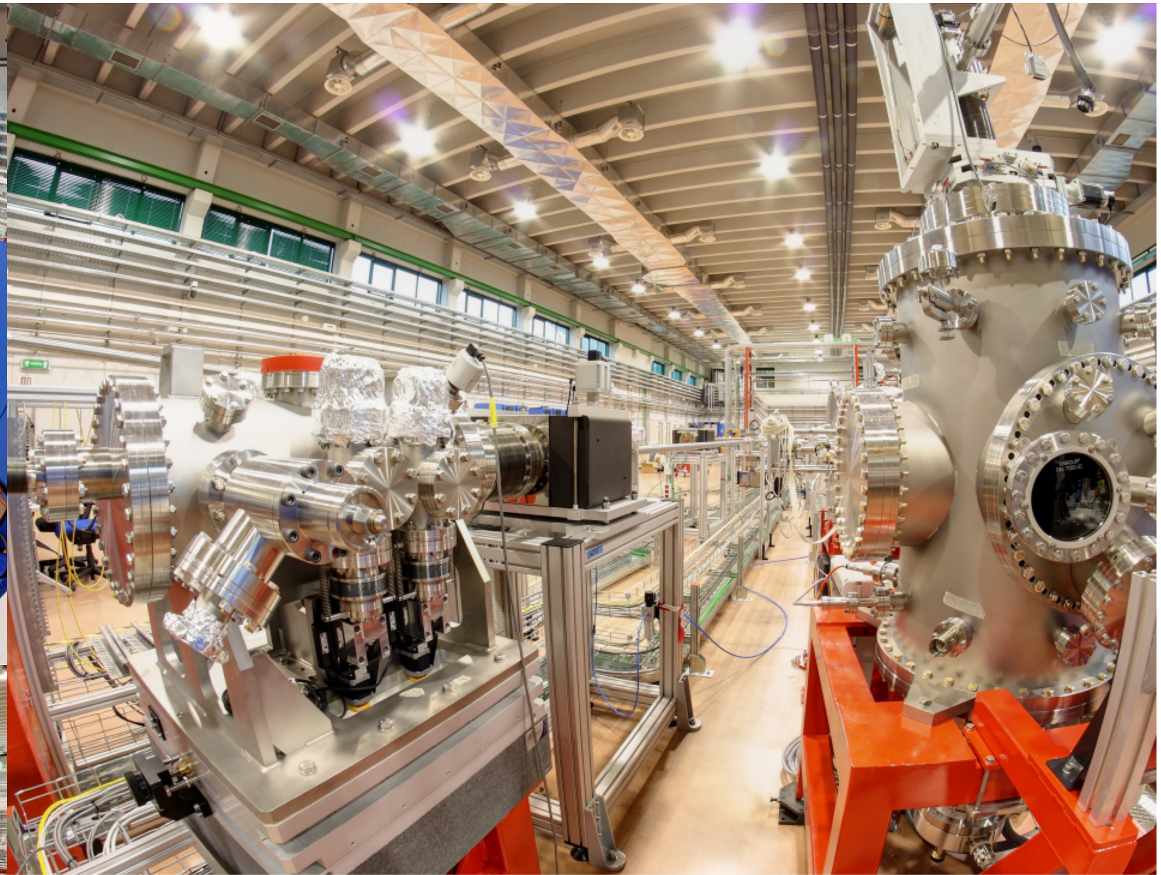
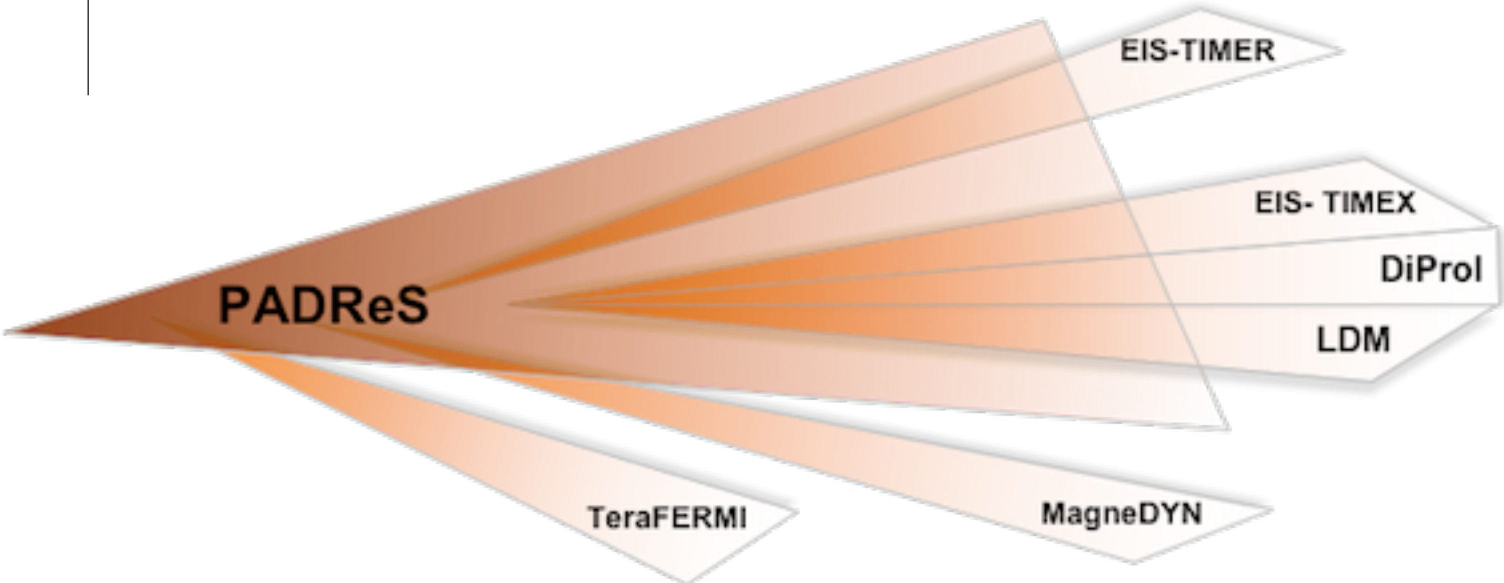
FERMI@Elettra: Experimental Hall





Diagnostic, Beamlines and Experimental Chambers



DIFFRACTION AND PROJECTION IMAGING ***M. Kiskinova***

- *Ultrafast Coherent Imaging*
- *Full-field x-ray Microscopy and Lensless Imaging*

ELASTIC AND INELASTIC SCATTERING PROGRAM ***C. Masciovecchio***

- *t-Resolved Spectroscopy of Mesoscopic Dynamics* **TIMER**
- *Elastic Scattering from Matter under Extreme Conditions* **TIMEX**

LOW DENSITY MATTER PROGRAM ***C. Callegari***

- *Atomic, Molecular and Optical Science*
- *Spectroscopic Studies of Reaction Intermediates*
- *Clusters and Nanoparticle Spectroscopies*
- *Ultrafast Proc. & Imaging of Gas Phase Clusters and Nanoparticles*

Being completed: MAGNEDYN, TERAFERMI, TIMER

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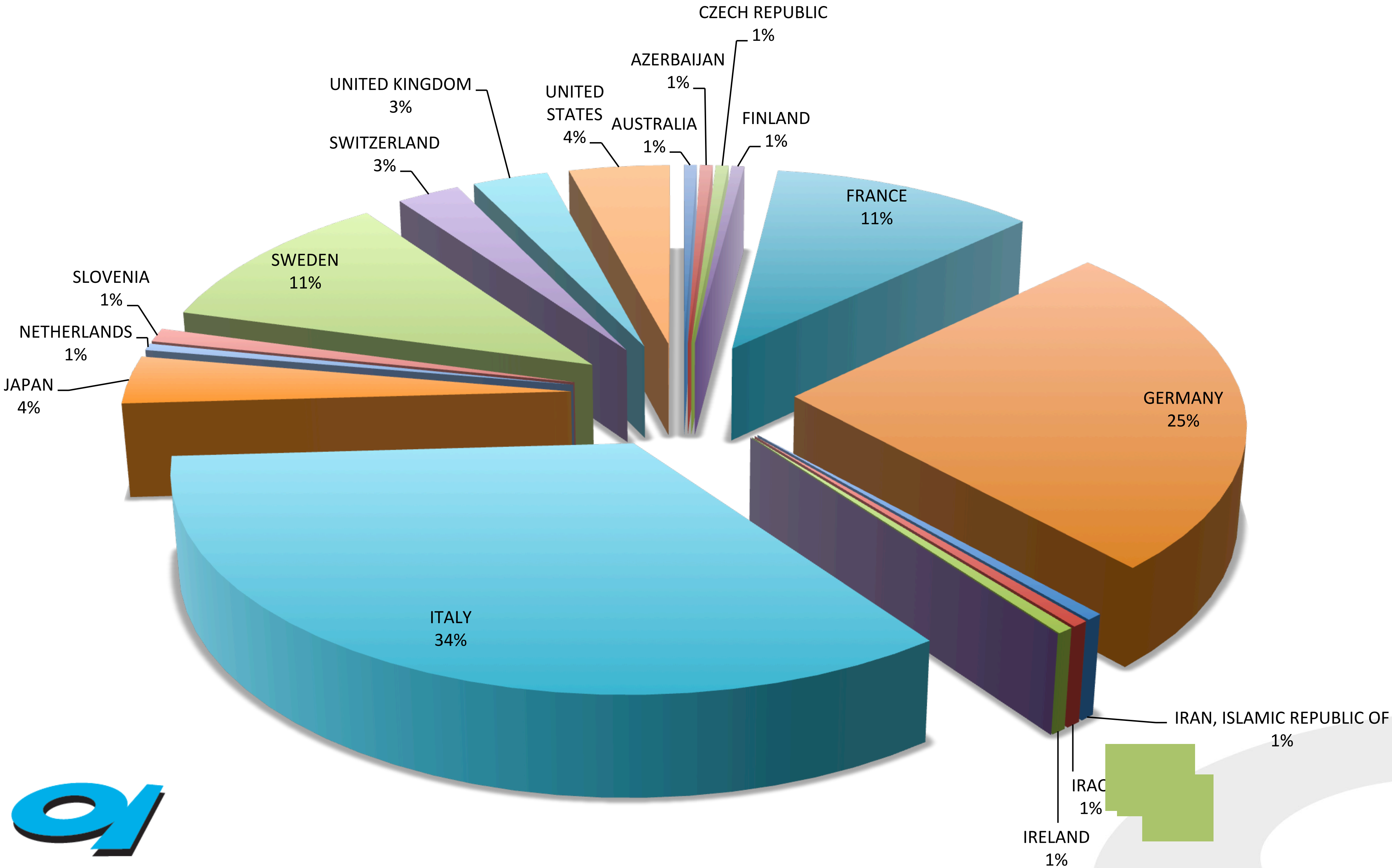
265 proposals submitted to FERMI in two years



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nature COMMUNICATIONS

Andrew Martin et al. (2014)

DIPROI

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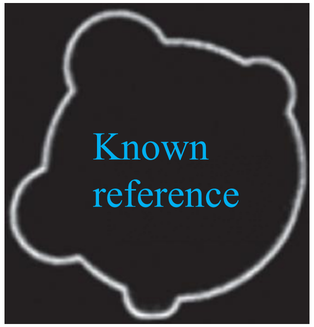
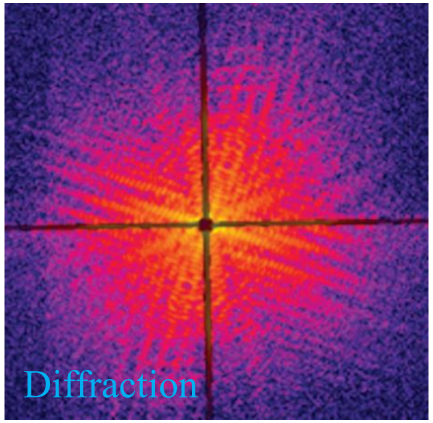
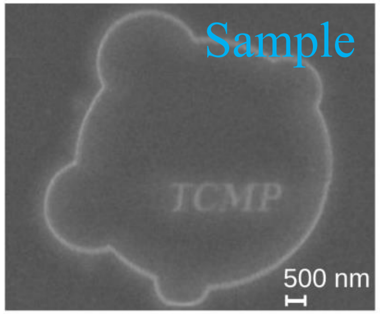
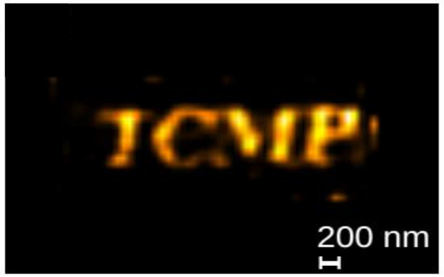
X-ray **holography** with **customizable reference**

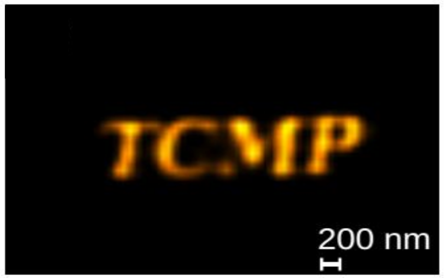
Ideal FTH → overcoming restriction due to the reference wave → single-shot imaging







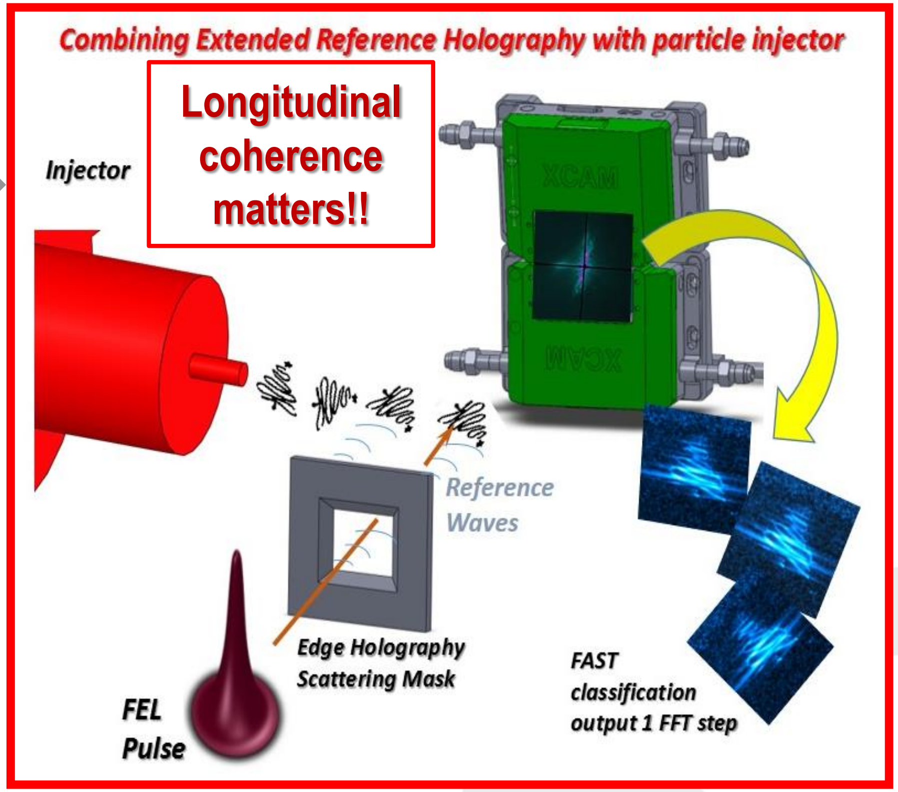




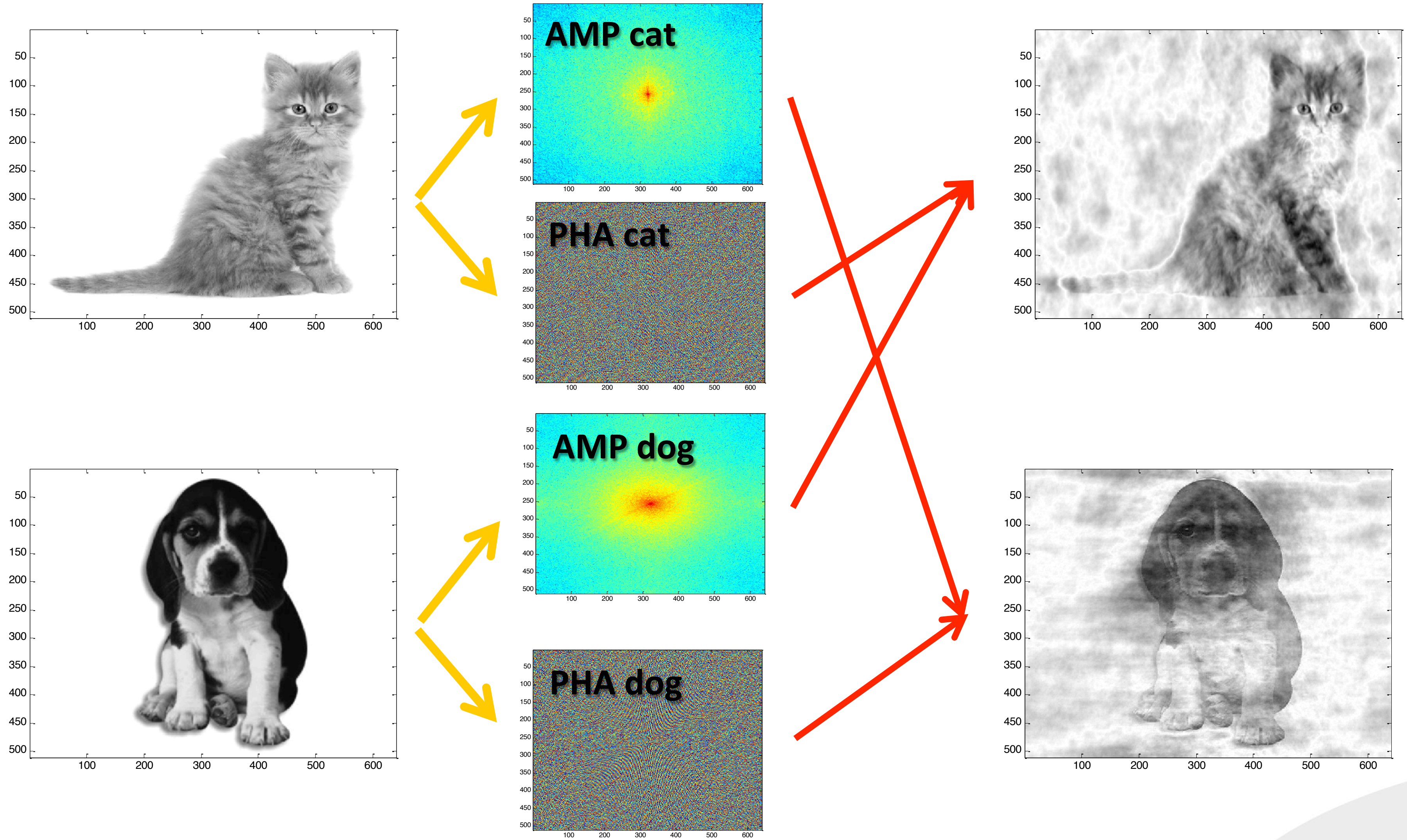
Hologram refined with RAAR phase retrivial

Conjugate-gradient algorithm to recover the image

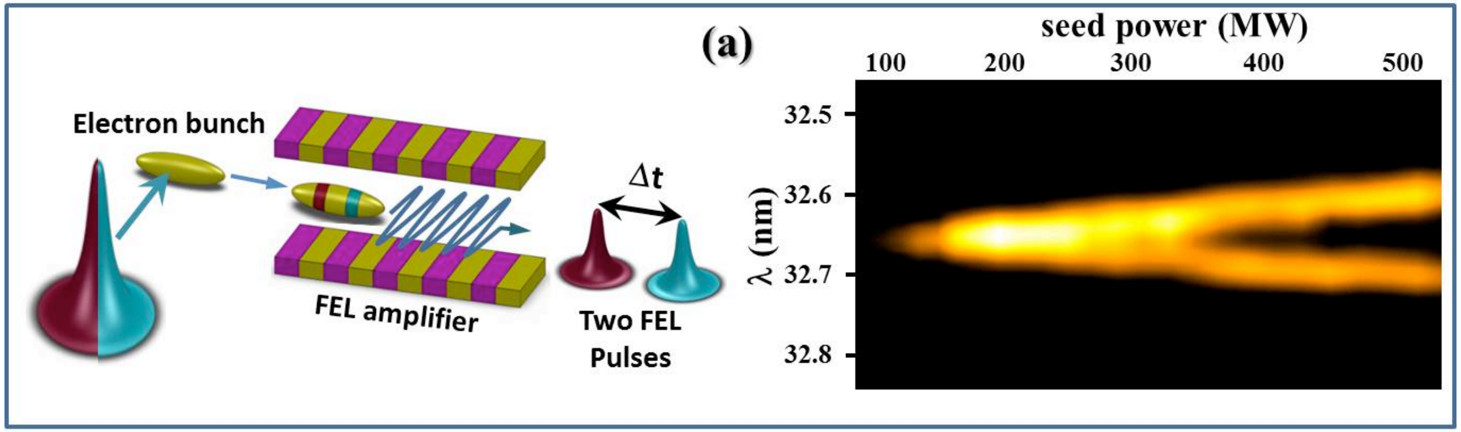
FTH with an almost **unrestricted choice for the reference**

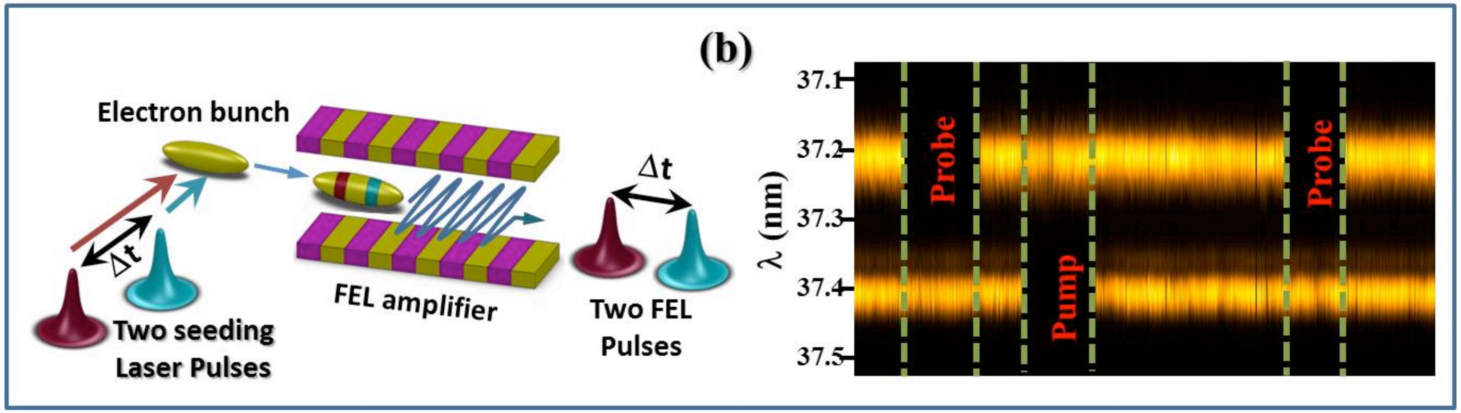


Phase vs fuzzy is important



One pulse good, two pulses better

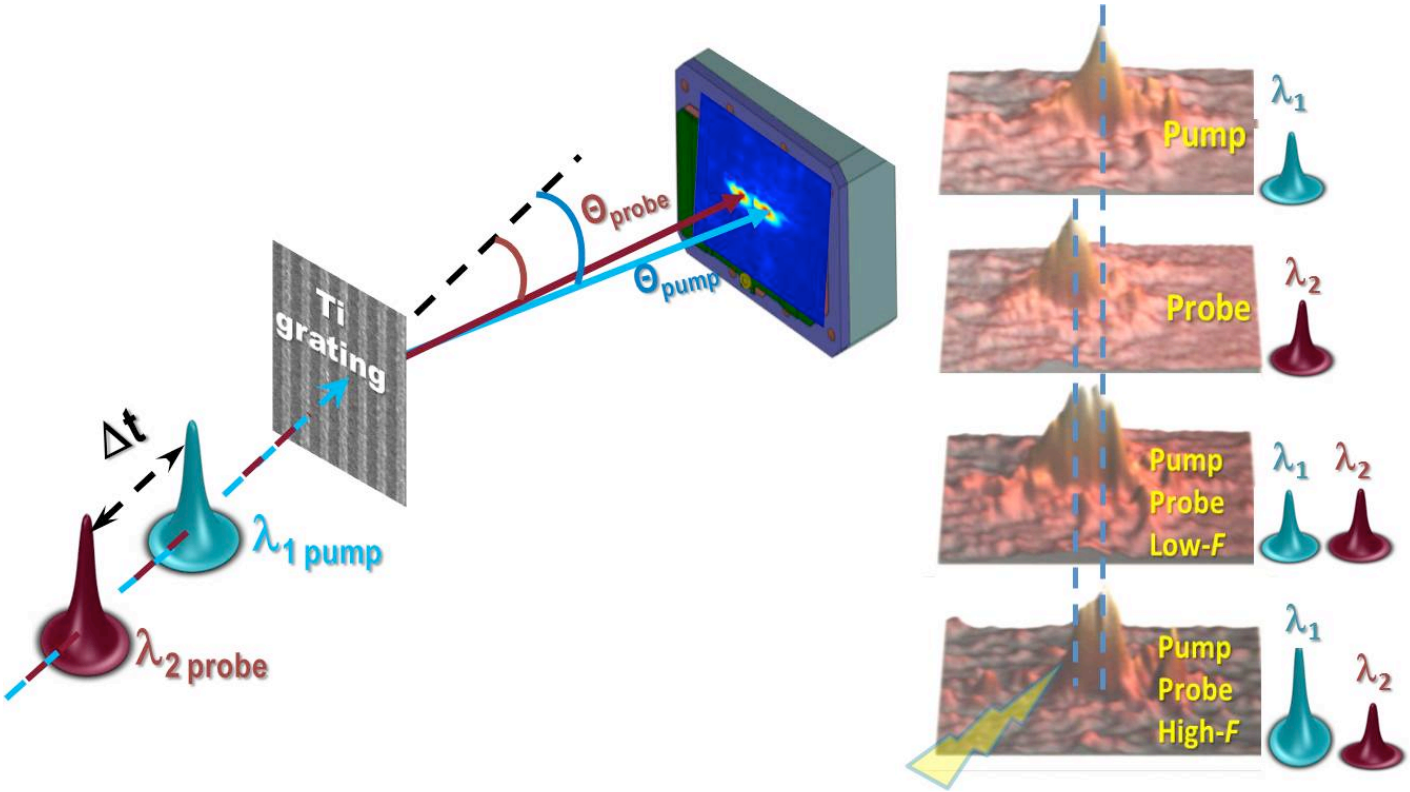




(a) Generation of two-color pulses using powerful seed laser pulse which carries significant frequency chirp. The right panel shows the wavelength split as a function of seed power.

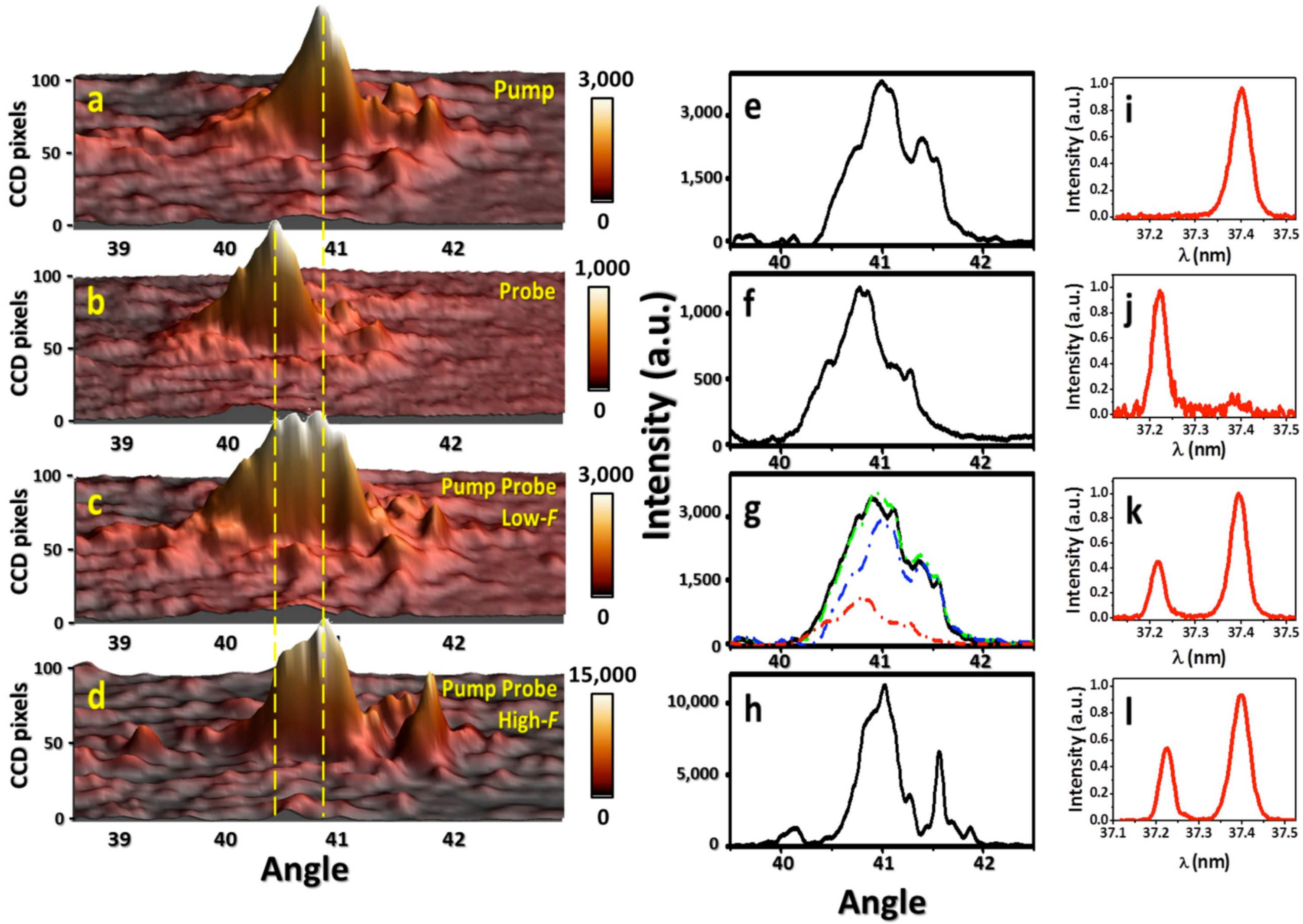
(b) Generation of two-color pulses using two independent seed laser pulses with slightly different central wavelengths. The right panel shows sequence of consecutive two-color spectra where the green dash lines highlight the intentional suppression of one of the FEL pulses.

Multiple pulse configuration



(Left) Two-color FEL pulses, I_1 and I_2, tuned across the Ti M-resonance, impinge on a Ti grating with a temporal separation, Δt.
(Right) Diffraction patterns corresponding to single color ‘pump’ and ‘probe’ pulses and to two-color ‘pump’-‘probe’ pulses (delayed by 500 fs) for different flux (F) regimes: low-F = 10-30 mJ/cm^2, high-F = 2 J/cm^2.

A tale of two pulses



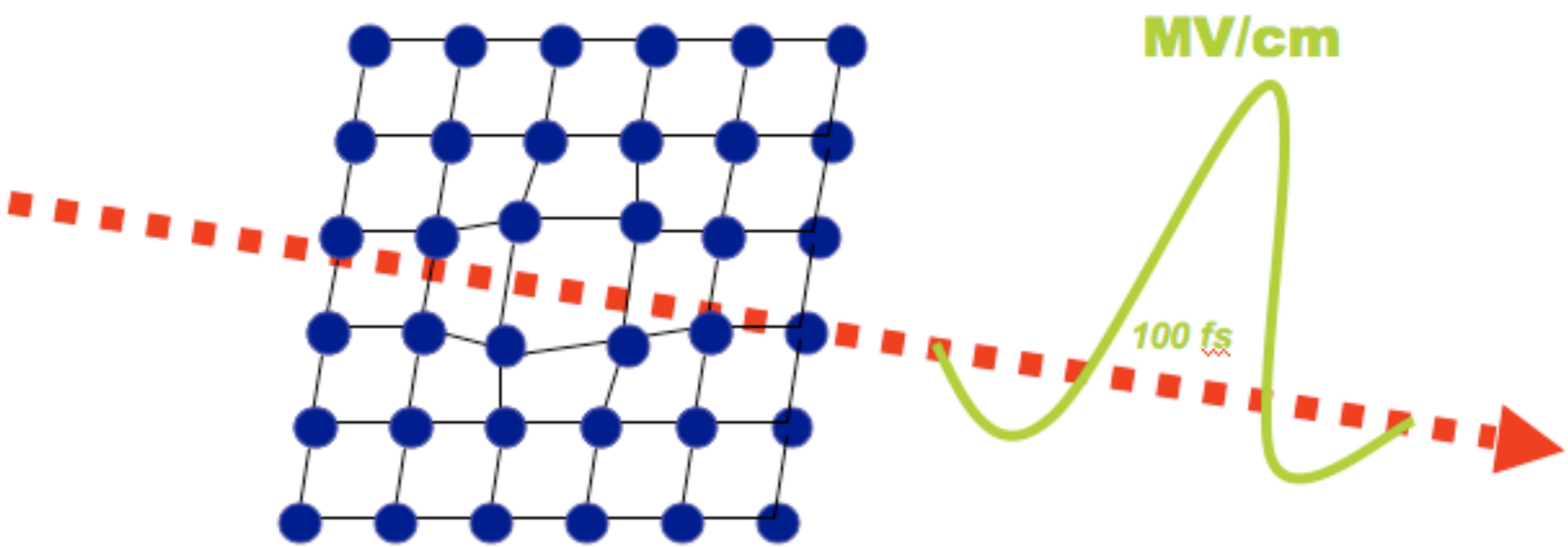
At high fluence → evidence for dramatic changes in the Ti electronic structure: high degree of ionization that makes the grating 'transparent'.
The pulse length (~90 fs) and the delay (500 fs) are shorter than the time scales of hydrodynamic expansion 1 - 10 ps

TeraFERMI

Non-linear THz optics at MV/cm fields

Ultra-short, high-power THz pulses between 1 mm - 20 μm (0.3 -15 THz)

Pumping on electronic, vibrational, magnetic excitations
->Superconductivity, Heterostructures, Magnetism, etc.



Elettra Sincrotrone Trieste

Product Portfolio

Accelerator Parts

Elettra, over the years, has acquired great experience in developing and realizing accelerators components, i.e. undulators, resonant cavities etc. For the production of Insertion Devices, a specific spin-off company (Kyma S.r.l.) has been set-up, while other components will be provided directly by Elettra.

Product list

- Low Level RF Electronic Units
- Electromagnetic RF devices
- Elettra Type RF Cavities and Accessories
- 3D magnetic structures
- Chicane Bunch Length Compressors

Lab Instruments

Several instruments necessary for typical or extreme applications are available: fast picoammeters, multi-point strain gauge, charge pulse amplifiers, ion chambers, pulse generators, RF filters etc. Every tool is intelligent and in some cases "Epics/ Tango interface" is already provided.

Product list

- AH401 / AH401B Picoammeter
- PIT-RFLN-Wide Bandwidth Pulse Amplifier
- AH501 Picoammeter
- RUD-RFLN-XLS Pulse Amplifier
- AH501B Picoammeter
- XPi Data Acquisition System
- L01 DOSFET Reader

Power Supply Equipment

New families of intelligent (DSP or PC embedded) power supplies, that cover many typologies (high voltage/ current, four-quadrant etc.) and configurations are forthcoming. Epics or Tango interface are often already present and custom-built solutions are possible.

Product list

- MAS-TER HV Bipolar Power Supply System
- HiSTAR Series Power Supply

Detectors

Photons and charged particles detectors, based on cross delay anodes, multi anodes and centroid finding techniques are steadily developed. 3D information (x, y, time) with spatial and time resolutions in the order of tens of microns and picoseconds are available through many custom-built solutions.

Product list

- Photons and charged particles 3D (x,y,t) detectors
- XBPM-DR1 X-ray Beam Position Monitor
- BLM - IC02 Ionization Chamber Beam Loss Monitor
- FCB-001 Cavity Beam Position Monitor

Elettra Sincrotrone Trieste

KYMA

KYMA born in 2007 as Sincrotrone Trieste spin off to produce undulators for Synchrotron and FEL light sources

10 employees

4 million Revenues

More than 50 Undulators already supplied in worldwide Synchrotrons/FEL:

- Elettra for Fermi (Italy)
- Brookhaven National Laboratory for NLSL-II (USA)
- Pohang Accelerator Laboratory for PLS2 (Korea)
- Max Plank Postech for PLS2 (Korea)
- Uppsala University for XFEL (Germany)
- ENEA for SPARC-FEL (Italy)
- Huazhang University for THz-FEL (China)

Elettra Sincrotrone Trieste

Construction of SESAME

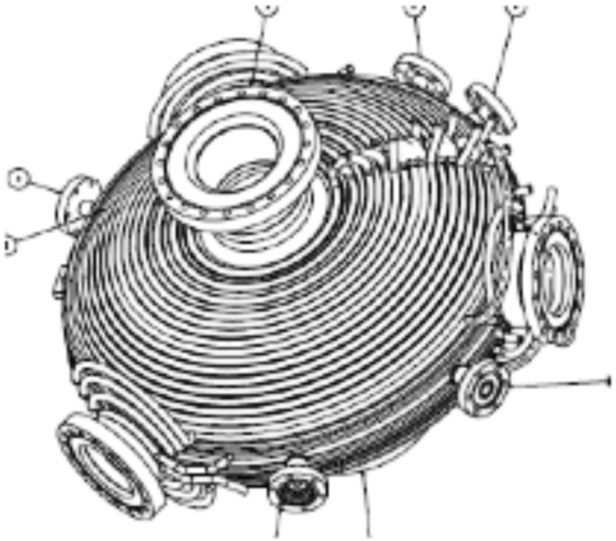
SESAME | SYNCHROTRON-LIGHT FOR EXPERIMENTAL SCIENCE AND APPLICATIONS IN THE MIDDLE EAST

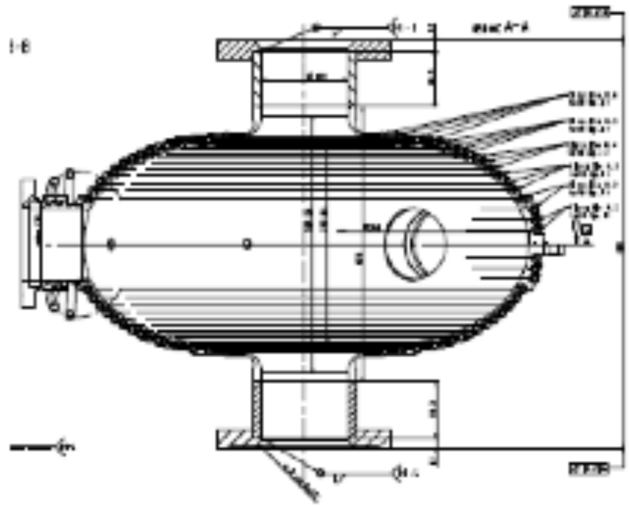
SESAME

INFN Istituto Nazionale di Fisica Nucleare

Andrea Lausi - August 31st, 2016

€1.250.000 collaboration contract signed on May 12, 2014





The main characteristics of the RF cavity accelerating will be:

f_0	499.654 MHz ± 1 MHz
V_{acc} maximum	650 kV
Power losses	≤ 66 kW
R_{shunt}	≥ 3.2 MΩ

Elettra role:

- ✓ Produce 4 improved RF cavities
- ✓ Train SESAME personnel in RF

Sesame User Office

VUO - Virtual Unified Office

VUO - Welcome to the Virtual Unified Office

Login

Username: [Login]

Password:

Indicate as username your identification code (USER ID) or your e-mail and the password

Lost password

If you are already registered but **you don't remember your identification code (USER ID) and/or password** please don't try to register again but click here to retrieve the lost information via e-mail.

Registration

If you are a new user select this link and go on with your registration. You will receive as soon as possible an identification code and a password.

Resource booking

Show here a calendar usage of the meeting rooms of SESAME site.
To book an event you must login in the VUO using username and password as indicated in the «Login» section.

Calendar

For details on Beamtime Allocation Calendar have a look at the SESAME Calendar.

Publication Search & Submission

Please note that all publications resulting from measurement runs or research done at SESAME must be entered into the SESAME Publication Database.

Authors are invited to complete the SESAME Publication Search and Submission Form online for each contribution, i.e. journal article, conference presentation, book or book chapter, thesis, contributed news articles, internal staff reports, general SESAME publications, brochures, etc.

Only published contributions should be submitted through this form.

Frequently Asked Questions

In case of problems or malfunctions a browser with javascript enabled.

For any further enquiry please, have a look to the FAQ.

SESAME - Synchrotron Light for Experimental Science and Applications in the Middle East

Address:
P.O. Box 7
Allan 19252
Jordan

Other contact information:
Telephone: (+962-5) 3511348, ext. 204
Fax: (+962-5) 3511423
www.sesame.org.jo

VUO contacts | Disclaimer | Privacy policy

DEVELOPED BY Elettra Sincrotrone Trieste

Elettra Virtual Unified Office

Elettra Sincrotrone Trieste

VUO - Virtual Unified Office

VUO - Welcome to the Virtual Unified Office

Login

Username: roberto.pugliese [Login]

Password: ••••••••••

Indicate as username your identification code (USER ID) or your e-mail and the password (for Sincrotrone Trieste users it is valid also the password used for the e-mail system Marconi).

Umbrella System: login

Lost password

If you are already registered but **you don't remember your identification code (USER ID) and/or password** please don't try to register again but click here to retrieve the lost information via e-mail.

Registration

If you are a new user select this link and go on with your registration. You will receive as soon as possible an identification code and a password.

Visits to the Elettra laboratory

If you are planning a visit to our laboratory just click here and fill the form. You will be contacted by our visitors office.

Se intendi pianificare una visita al nostro laboratorio seleziona questo link ed inserisci i dati della tua richiesta. Sarai contattato dal nostro "Ufficio visite" quanto prima.

Our visits statistics

Strategic committee agenda *

Show here the year planning of the Strategic Committee *(Restricted access)*

Resource booking *

Show here a calendar of the usage of the meeting rooms of the Elettra site.
To book an event you must login in the VUO using username and password as indicated in the «Login» section.

Calendar

For details on Beamtime Allocation Calendar have a look to Elettra or FERMI Calendars.

Seminars

Forthcoming seminars@Elettra
Forthcoming seminars@TASC

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Search here for Books & CDs in the Elettra Library.

Publication Search & Submission

Please note that all publications resulting from measurement runs or research done at Elettra must be entered into the Elettra Publication Database.

Authors are invited to complete the Elettra Publication Search and Submission Form online for each contribution, i.e. journal article, conference presentation, book or book chapter, thesis, contributed news articles, internal staff reports, general Elettra publications, brochures, etc.

Only published contributions should be submitted through this form.

Frequently Asked Questions

In case of problems or malfunctions check first if your are using a correct version of the browser (Mozilla 1.0, Netscape 6 or Internet Explorer 5.5 or above with javascript enabled).

For any further enquiry please, have a look to the VUO FAQ page .

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PEC: sincrotrone.trieste.elettra@legalmail.it
www.elettra.eu

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Società di interesse nazionale
ai sensi dell'art. 10, comma 4,
L. 19 ottobre 1999 n. 370

VUO contacts | Disclaimer | Privacy policy

VUO Going Open-Source

- ✓ At the beginning of 2016 Elettra launched a project with the objective to transform the VUO in order to release it as an Open Source Software.
- ✓ The project included among the activities the efinition of the OSS strategy (community, license), the creation of the OSS repository and porting of the VUO packages of potential interest outside Elettra in order to be able to run them on the free Oracle XE database engine.
- ✓ The project project included the support activities (developments) needed to have the OSS version of the VUO adopted by SESAME SRF.
- ✓ The Porting of the core VUO packages (about 30) was executed with success and today Sesam has a running instance of the system
- ✓ Side effects are also the improvement of the VUO core and the possibility to use the same platform to implement the in-kind contribution management system for ESS as part of the BrightnESS EU H2020 project.

Elettra
Sincrotrone
Trieste

SOLARIS Project

- ✓ Construction of a 1.5 GeV synchrotron in Krakow (PL)
- ✓ Technologically identical to the MAX IV 1.5 GeV ring (Lund, S)
- ✓ Linac injector operated at 550-600 MeV
- ✓ Ring operated in a ramped-decay mode (550 MeV → 1.5 GeV)

Elettra's role:

- ✓ Provide expertise in many design, installation, test and commissioning tasks
- ✓ Construct beamline

€ 3.520.000

Andrea Lausi

Elettra-Sincrotrone Trieste S.C.p.A.