



TIARA-mTM



TIARA website: <http://www.eu-tiara.eu>

Mid-Term Meeting
R. Aleksan
CIEMAT, June 12th. 2012

61 registered participants as of today

Welcome to

Tiara

mid-Term Meeting

1. Meeting Objectives
2. General Information
3. Deliverables/milestones
4. Mid-Term meeting
5. Conclusion



Thanks




Test Infrastructure and Accelerator Research Area

TIARA General Mid Term Meeting



12-14 JUNE 2012
CIEMAT- MADRID- SPAIN www.eu-tiara.eu

Heartily thanks to

Prof. Cayetano López
Director General

and

Prof. Ramon Gavela
Deputy Director General

and

Jose M. Perez
Director of Technology
for hosting TIARA

TIARA Steering Committee
 Roy Aleksan (CEA)
 Marica Biagini (INFN)
 Sébastien Bousson (CNRS/IN2P3)
 Philip Burrows (JAEA)
 François Kircher (CEA)
 Ken Long (JCL)
 Yannis Papaphilippou (CERN)
 Paolo Pierini (INFN)
 Céline Tanguy (CEA)
 Anders Unnevik (CERN)

Local Organizing Committee (CIEMAT)
 Susana Falcón Cabrera
 Marisa Marco Arbolí
 Jose Manuel Pérez Morales
 Diego Obradors Campos

Information & Registration:
<http://events.ciemat.es/web/tiara>
 Contact: tiara@ciemat.es

Supported by the European Community
 (FP7 Research Infrastructures Action)





General context



- ✦ Europe is going through an unprecedented crisis since the last World War
- ✦ This crisis will be long and is calling for a new political, economical and financial model
- ✦ There will be (is) opposite temptations /dangers
National withdrawal vs European Solidarity
“Communautarisme” vs Multiculturalism

As we did in the past, scientists (we) have to play a leading role in paving the way toward a peaceful and collaborative society

We have to work together to show that our Society needs

Science for Europe and Europe for Science



Potential of Accelerators is huge



The development of state of the art accelerators is essential for many many fields of science (fundamental, applied or industrial)

★ Research accelerators

▪ Particle Physics, Nuclear Physics, Research fields using light source, Research fields using spallation neutron sources, Study of material for fusion, Study of transmutation...

In past 50 years, about 1/3 of Physics Nobel Prizes are rewarding work based on or carried out with accelerators

This « market » represents ~15 000 M€ for the next 15 years, i.e. **~1 000M€/year**

★ Clinical accelerators

▪ radiotherapy, electron therapy, hadron (proton/ion)therapy...

★ Industrial accelerators

▪ ion implanters, electron beam and X-ray irradiators, radioisotope production...

This market represents **~3 000M€/year** and is increasing at a rate of **~10% /year**



TIARA Objectives



The Big Issues to be integrated within TIARA

- ✦ Coordinated wide scope sustainable programme
- ✦ Collaborative R&D projects
- ✦ Access to broad variety of large infrastructures
- ✦ Enhanced Partnership and Technology Transfer to Industry for boosting innovation
- ✦ Strong Education & Training in Accelerator Science and Technology



Mid-TERM meeting Objectives



Main objectives

- ❖ *Provide general information on TIARA*
- ❖ *Review the work done so far*
 - *deliverables/milestones, highlights, difficulties*
- ❖ *Prepare for second half of TIARA-PP (ending dec. 2013)*
- ❖ *Exchange our views on how to strengthen accelerator R&D*

Note also

- ❖ *mTM (with next biannual report) is acknowledged by the EC as being part of the mid-term review*

Note : TIARA-PP is timely with the European Strategy for Particles Physics



TIARA general information



★ Strong Interest for TIARA from many communities

- ESRF (visited on February 14th)
- ESS (see P. Carlson talk on Thursday)
- ITER/F4E (discussion with R. Heidinger on April 18th)
- NuPPECC (TIARA presentation at NuPPECC meeting on June 16th)
- ECFA (TIARA presentation at RECFA meeting on October 6th)

★ Further information relative to TIARA

- Change in the EC unit for Infrastructures
 - ⇒ Visited new unit leader (A. Antelo) on February 28th
- TIARA poster represented at ICRI 2012



TIARA general information



Other information

- ❖ EuCARD2 project approved (but negotiation delayed)
- ❖ Accelerator R&D is a full topic for PP Strategy
 - ⇒ 2 hour session at Krakow symposium

TIARA general activities

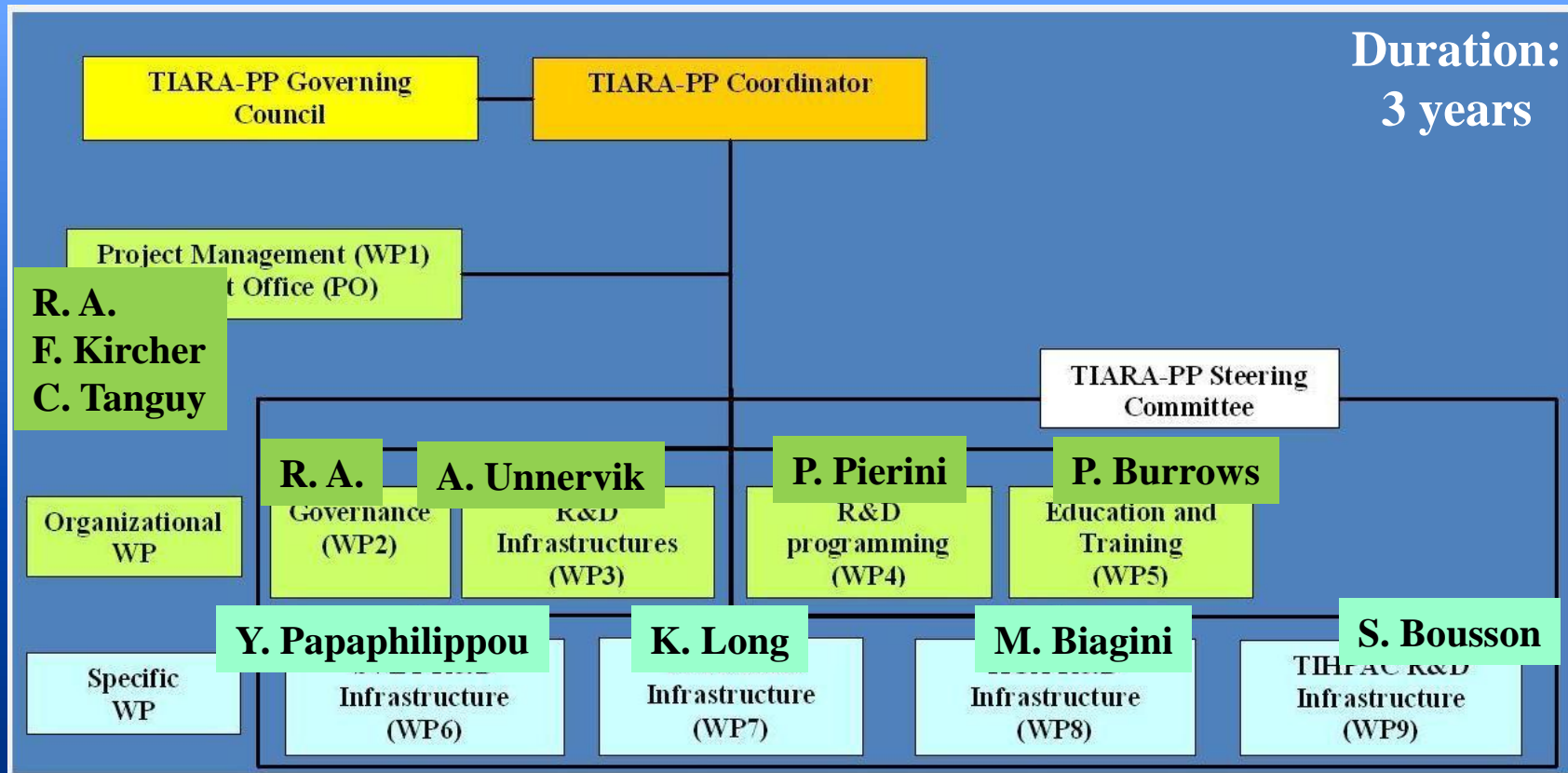
- ❖ On-going discussion for a joint TIARA-HILumi workshop with industry (cf. A. Unnervik)
- ❖ CD&O initiatives (Logo, newsletter, brochure, website... see C. Tanguy)
- ❖ Biannual report (June 2012) will be used as mid-term report



TIARA general information



Duration:
3 years

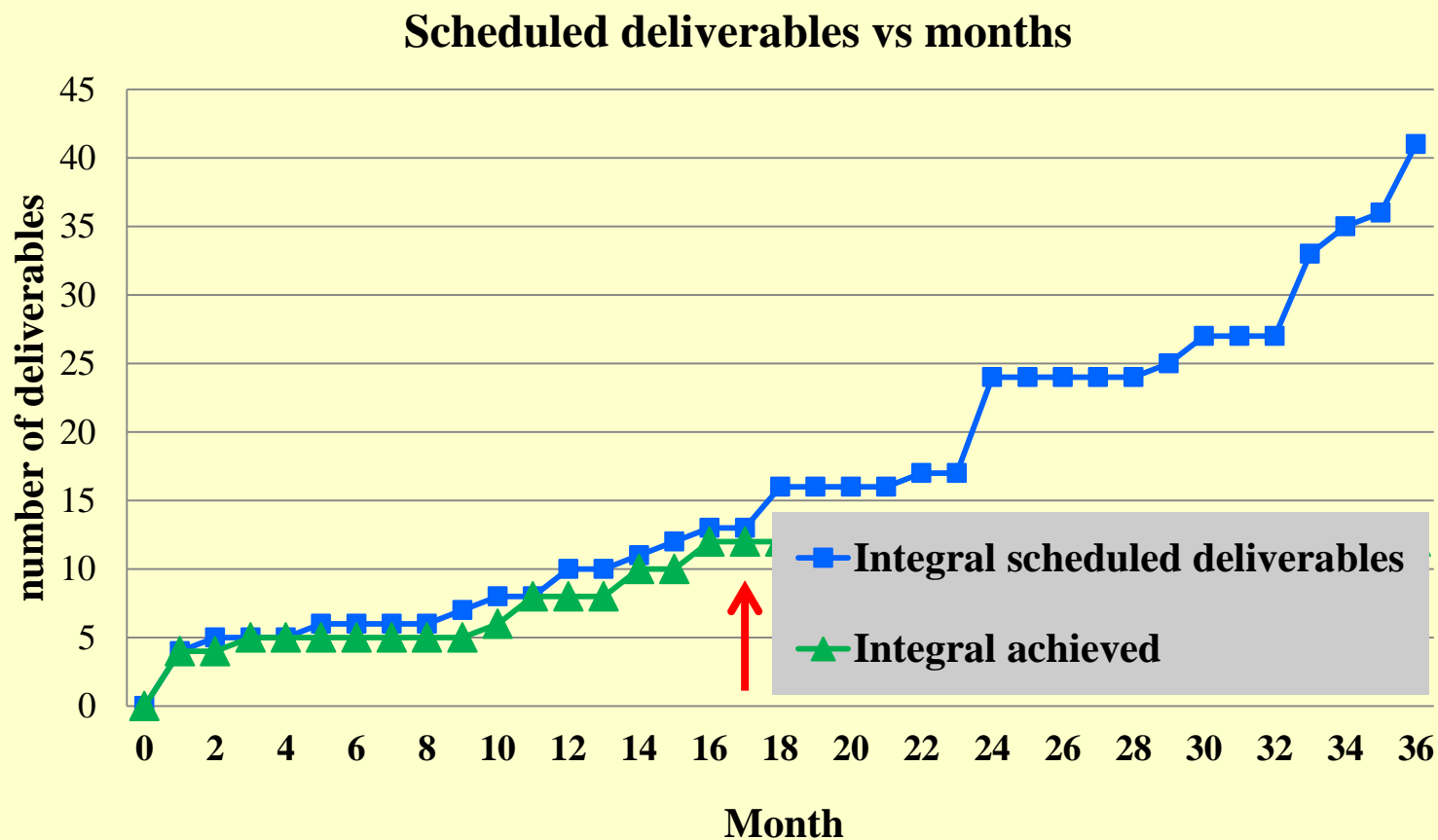




First period Deliverables



12 deliverables are available out of 13 due end May
+ 4 almost ready, to be delivered end June



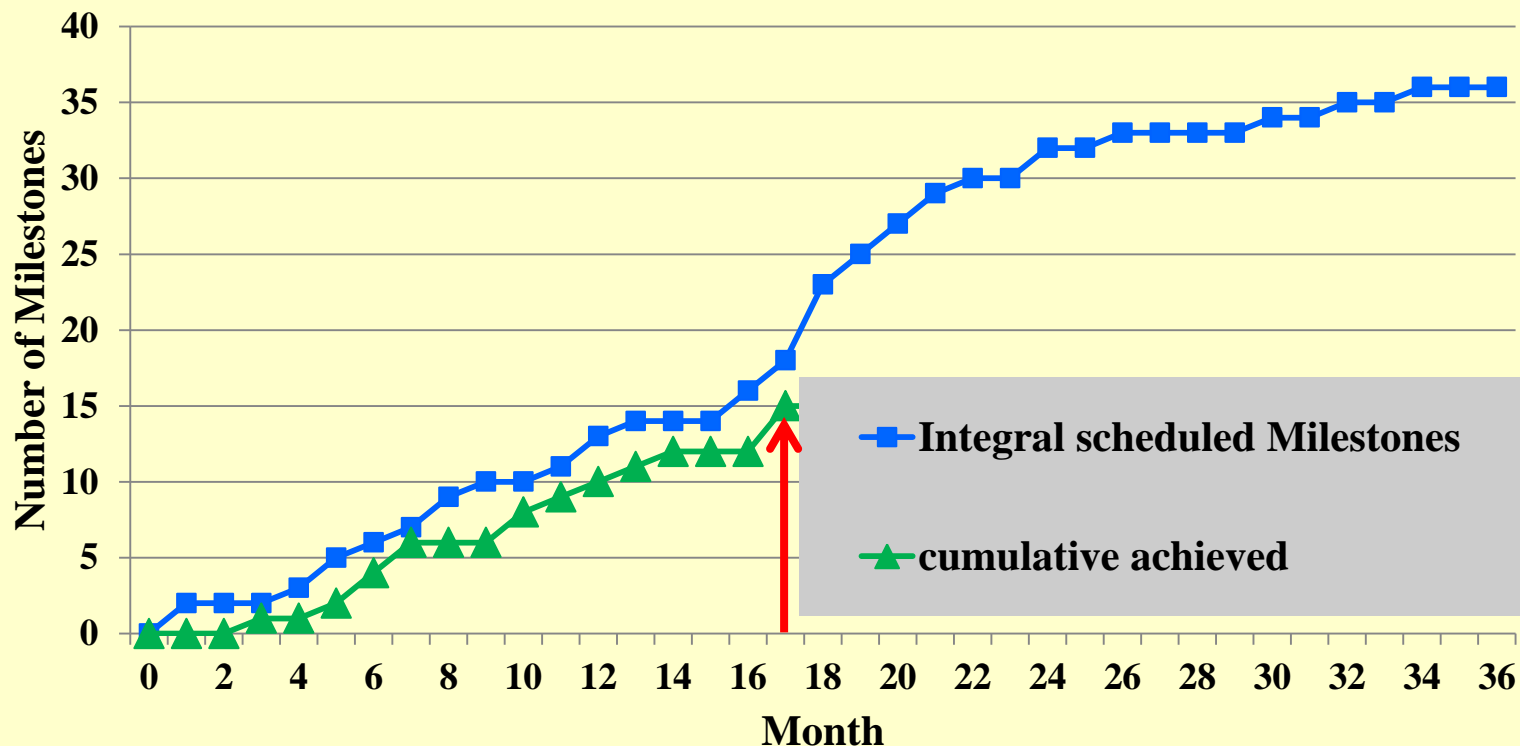


First period Milestones



15 milestones are achieved out of 18 due end May
+ 1 **not** needed, 1 almost ready, 1 delayed

Scheduled Milestones vs months





Some TIARA Achievements



... just a flavour

- **WP4: Key Accelerator Research Area and Key Technical Issues**
- **WP5: Education and Training Survey and associated database**
- **WP3: Accelerator Infrastructure Survey and associated database**
- **WP6: World lowest emittance achieved at SLS**
- **WP7: RF distribution design of ICTF and first amplifier test**
- **WP8: first accelerating structure and input/output couplers of prototype fabricated**



Some TIARA Achievements

... just a flavour (non-exhaustive)



Domain	Projects	ESFRI Project List					Flavour Factories (SuperB)	Neutrino Factories Muon Colliders	High Intensity Hadron Facilities (Eurusol, ADS/MYRRHA, IFMIF)	3 rd Generation radiation sources	4 th Generation radiation sources, FEL, ERL	5 th Generation radiation sources
		XFEL	FAIR	ESS	LHC Upgrades (HL-HE)	Linear Colliders (ILC, CLIC)						
	KARA											
Accelerator Components	Sources and Injectors	x	x	x	x	x	x	x	x	x	x	
	RF Structures	x	x	x	x	x	x	x	x		x	
	RF Systems	x		x		x	x		x		x	
	SC Magnets		x		x	x	x	x				
	Conventional NC Magnet Systems		x			x				x	x	x
	Diagnostic and Instrumentation	x	x	x	x	x	x	x	x	x	x	x
	Targetry		x	x	x	x		x	x			
	Radiation Issues		x	x	x	x		x	x			
Accelerator Technologies	Electronics and Software	x	x	x	x	x	x	x	x	x	x	x
	UHV	x	x	x	x	x	x	x	x	x	x	x
	RF Sources	x	x	x	x	x	x	x	x	x	x	x
	Cryogenics	x	x	x	x	x		x	x			
	Alignment and Stabilization	x	x	x	x	x	x	x	x	x	x	x
Accelerator Concepts	Accelerator Design	x	x	x		x	x	x	x			x
	Beam Dynamics	x	x	x	x		x	x	x			x
	FEL Processes	x									x	x
	Beam Cooling		x					x				
	New Techniques for High Gradient Acceleration					x						x

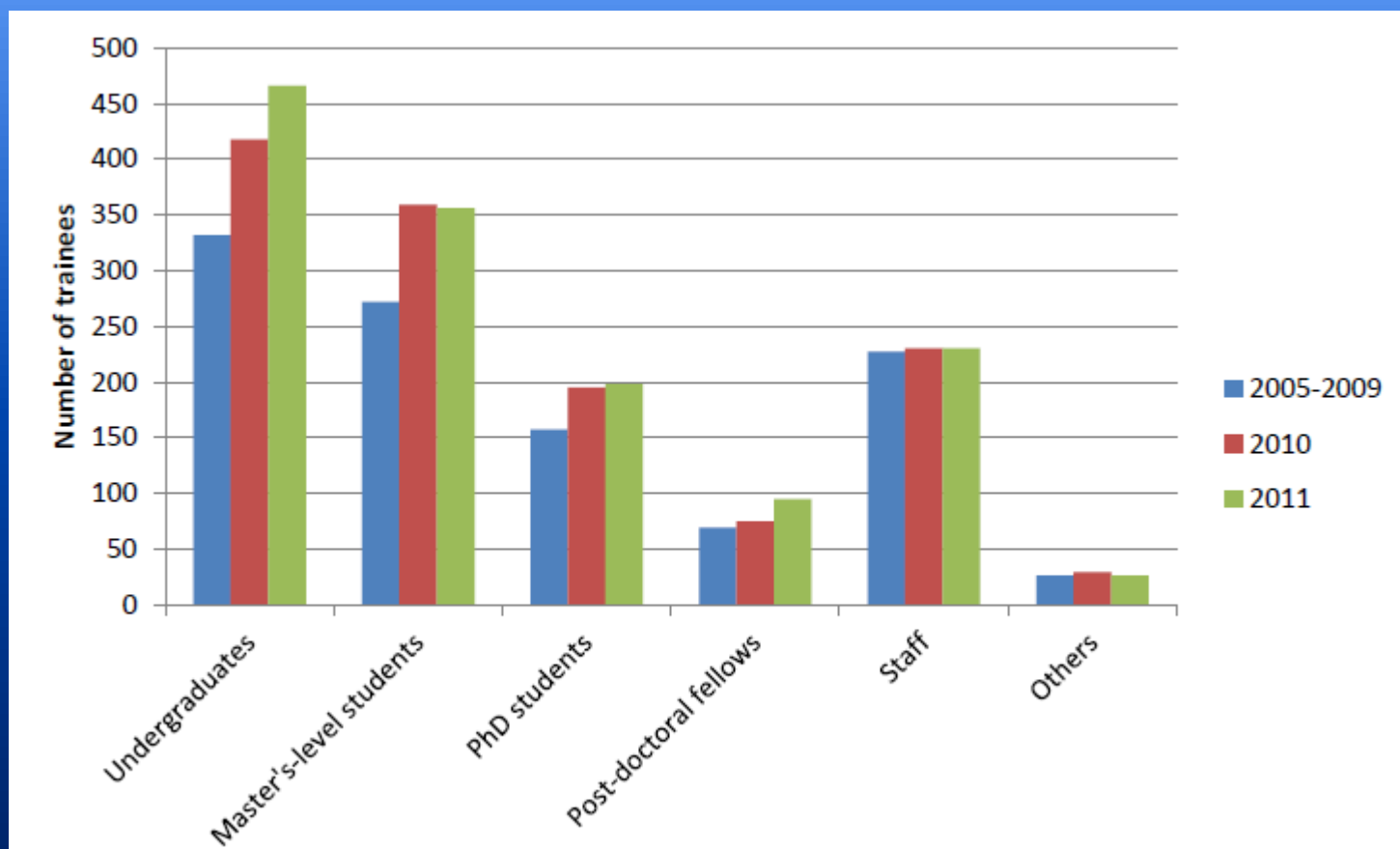


Some TIARA Achievements



... just a flavour (non-exhaustive)

1371 trainees in accelerator science and technology in Europe in 2011 (34% undergraduates, 26% master's students, 14% PhD students, 7% postdoctoral fellows and 17% staff)



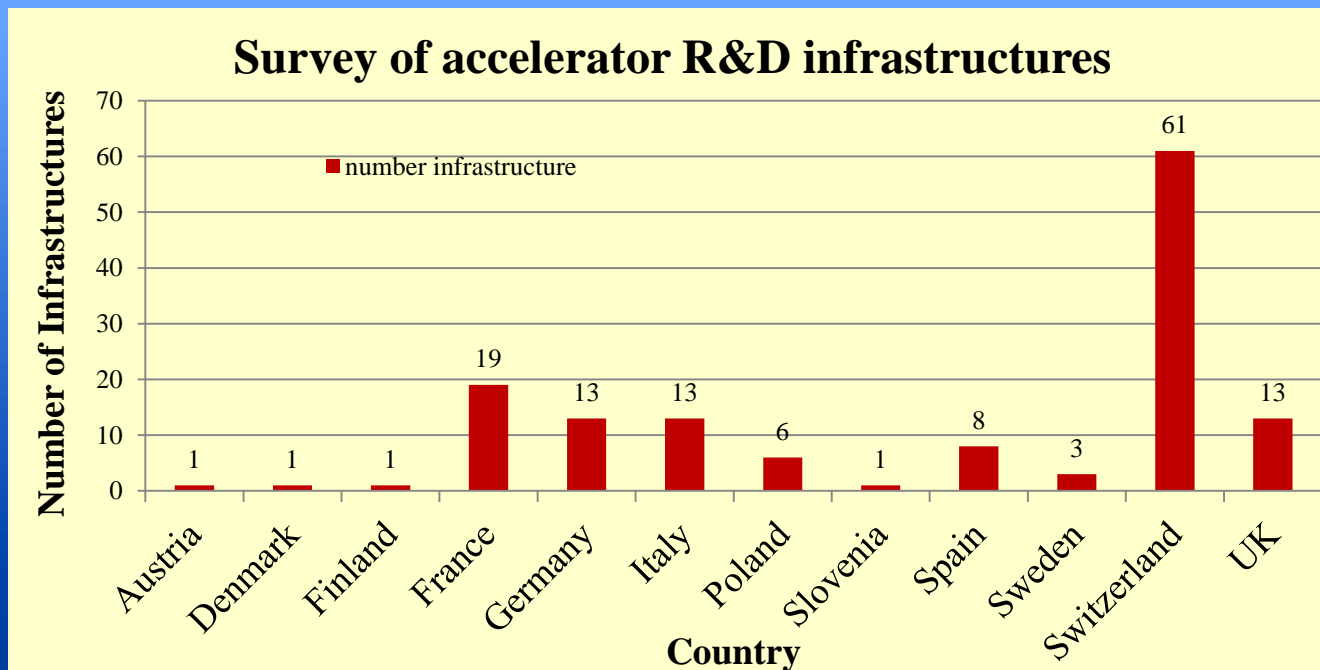


Some TIARA Achievements



... just a flavour (non-exhaustive)

➤ Infrastructures survey: 140 identified so far



➤ Industry

Established a list of 356 companies in 13 countries (all contacted 89 companies expressed interest to be further informed of TIARA developments
Concrete actions in preparation



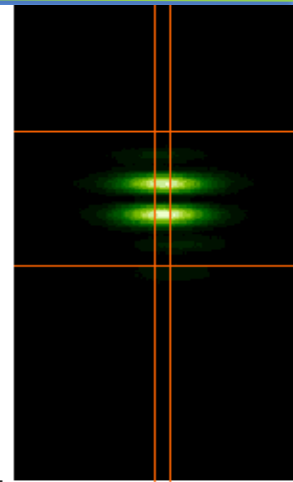
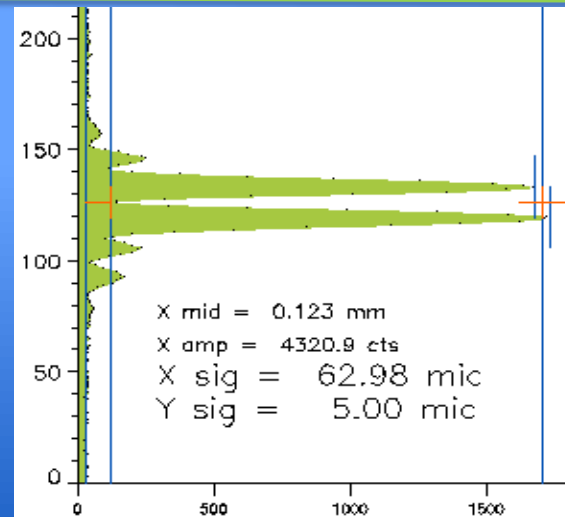
Some TIARA Achievements



... just a flavour (non-exhaustive)

Emittance achievements

- Best result up to March 16, 2011
- ⇒ Beam height $5 \pm 0.5 \mu\text{m}$ RMS
- ⇒ $\epsilon_y = 1.9 \pm 0.4 \text{ pm}$




Vertical emittance WORLD RECORD

End 2012:

$\epsilon_y = 0.9 \pm 0.4 \text{ pm}$
 with beam of 400 mA

20kV X600 20 μm

1 σ 2 σ



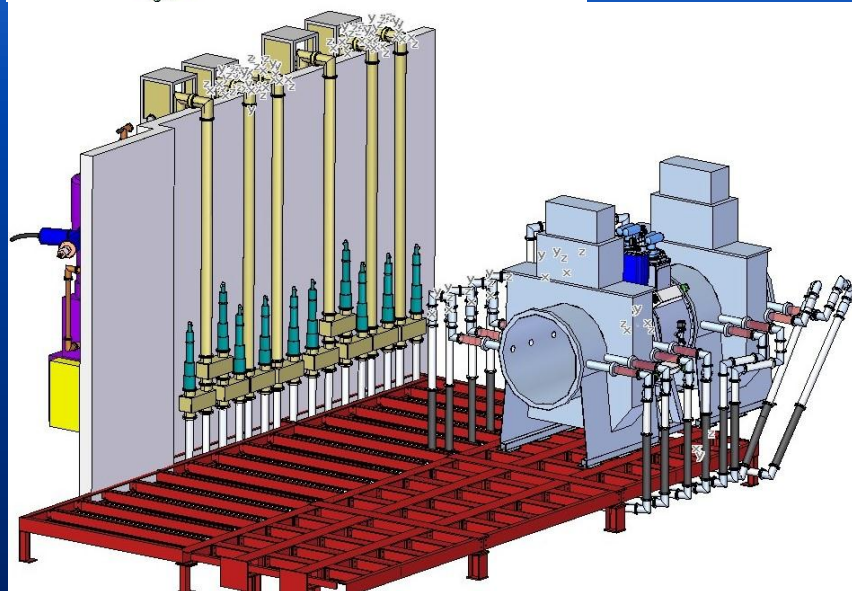
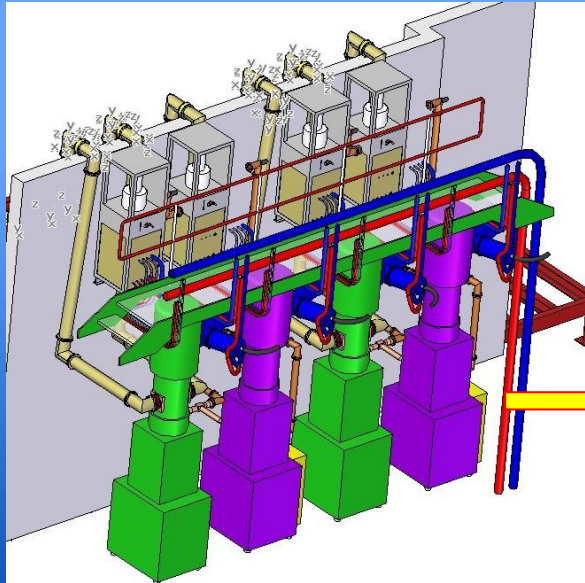


Some TIARA Achievements

... just a flavour (non-exhaustive)



RF distribution design of ICTF and first amplifier test



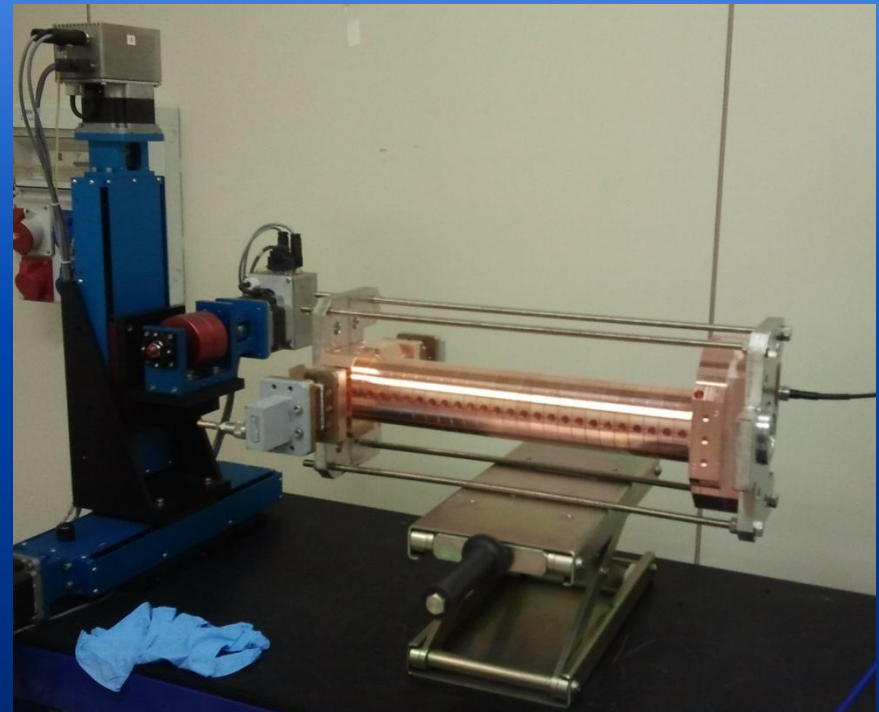
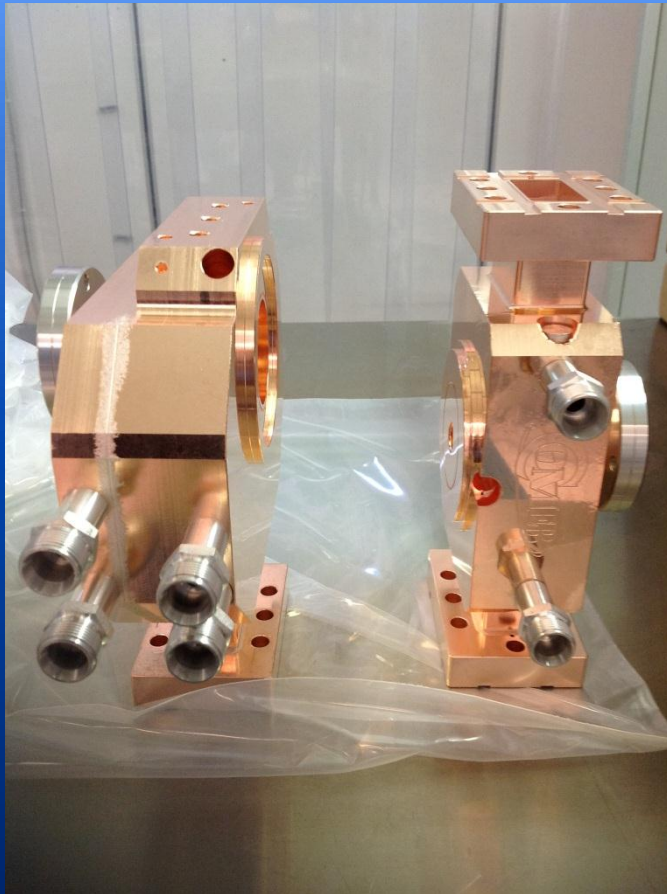


Some TIARA Achievements

... just a flavour (non-exhaustive)



SPARC test facility upgrade : first C-Band accelerating structure and input/output couplers of prototype fabricated





Some TIARA Achievements

... just a flavour (non-exhaustive)



- WP1: Besides the maintenance of external and internal Websites as well as the documentation database (21 documents so far)

Some other achievements for communication

Newsletter



<http://www.acceleratingnews.eu/>

New logo



Other actions will be presented during the meeting



Mid-Term block agenda

Madrid June 12th – 15th



<http://events.ciemat.es/web/tiara>

Draft agenda of the TIARA general mid-term meeting at CIEMAT Madrid, 12-15 June 2012				
appr. hour	1st day Tuesday 12 June	2nd day Wed. 13 June	Last day Thursday 14 June	Friday 15 June
08:30 or 09:00		Plenary session Highlight Talks	Plenary session HT and/or GIT	TGC meeting
10:30		Break	Break	Break
		Plenary session Highlight Talks	Plenary session WPs reports: WP6, WP7, WP8, WP9	TGC meeting
12:30		Lunch	Lunch	Adjourn TGC (13:00)
14:00	Plenary Session Welcome and General Interest Talks	WP parallel sessions WP2/WP3/WP4/WP5/ WP6/WP7?/WP8/WP9 ?	Plenary session WPs reports: WP3, WP4, WP5, WP2	
16:00	Break	Break	Adjourn	
	WP parallel sessions WP2/WP3+WP4/WP5/ WP6/WP7?/WP8/WP9 ?	WP parallel sessions WP2/WP3/(WP4)/WP 5/WP6/WP7?/WP8/W P9?	TGC meeting	
19:00	Adjourn	Adjourn		
19:30	welcome cocktail	Social dinner	TGC Dinner	



Conclusions



The objectives of TIARA are very ambitious and challenging



Work has started and is progressing reasonably well, but there is still a lot to do for this endeavor to be successful



It is our common task to make it a success and ensure the sustainability of accelerator R&D

...but for now, I wish you a very fruitful meeting



**TIARA will strengthen further
Accelerator science;
a powerful mean toward scientific, technical
and industrial breakthroughs...**