

Accelerator Activities at Spain

Bilbao
ESS

Barcelona
ALBA
UPC

Madrid
CIEMA
T
CMAM

Valencia
IFIC

Sevilla
CNA

Accelerator Activities for Future Linear Colliders

Accelerator Activities for Future Linear Colliders at Spain

Madrid
CIEMA
T

Valencia
IFIC

Barcelona
UPC

Accelerator R&D for FLC at CIEMAT



Capabilities

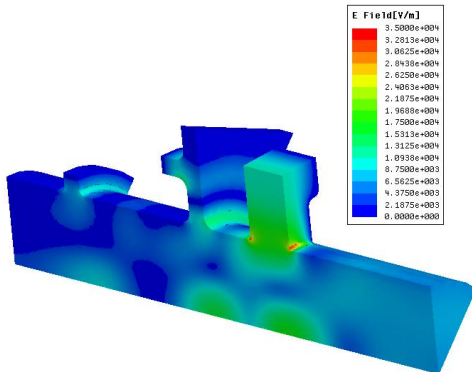
MAGNETS and RF STRUCTURES:

- CALCULATION

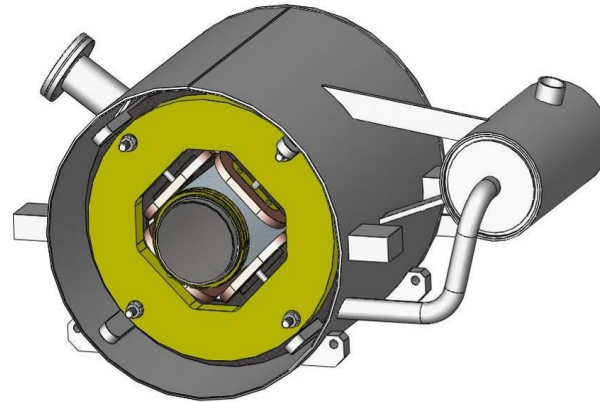
- Electromagnetic analysis
 - Electric circuits & electronics
 - Superconductivity
 - High and low frequency
- Mechanical analysis

- PROTOTYPING

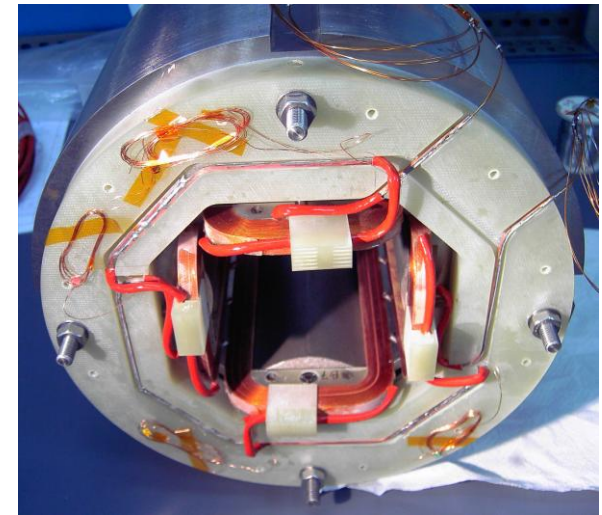
- Design: tooling, drawings
- Fabrication follow-up
- Assembly
- Testing and Calibration



RF calculation for PETS



3-D modelling of the magnet with its cryostat



Magnet during fabrication

Main ongoing projects

➤ *ILC and its Accelerator Test Facilities:*

ILC quadrupole package without BPM (Cos 2θ and super ferric) (DESY)

XFEL intersections: phase shifter (Including magnetic measurements), precision movers for quads, support base for the full intersection (DESY)

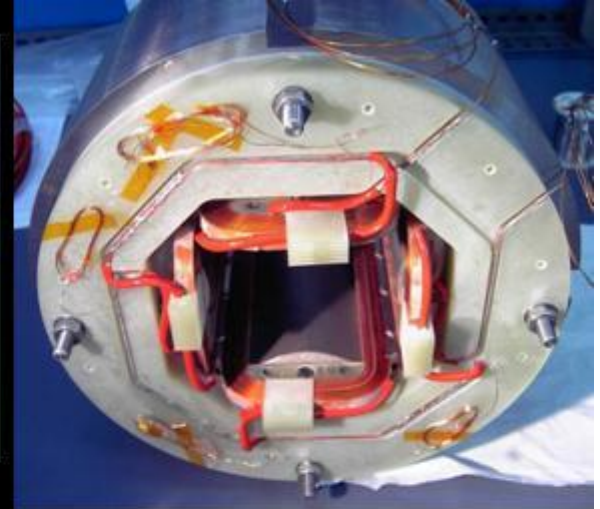
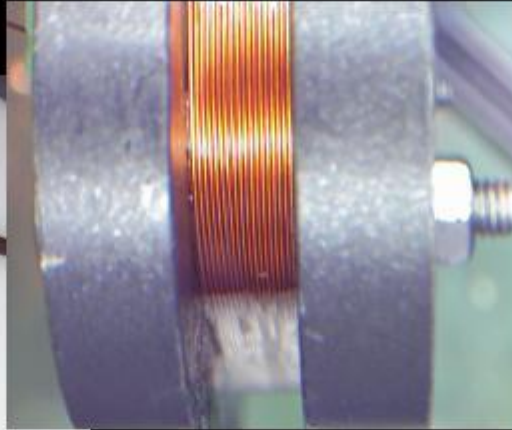
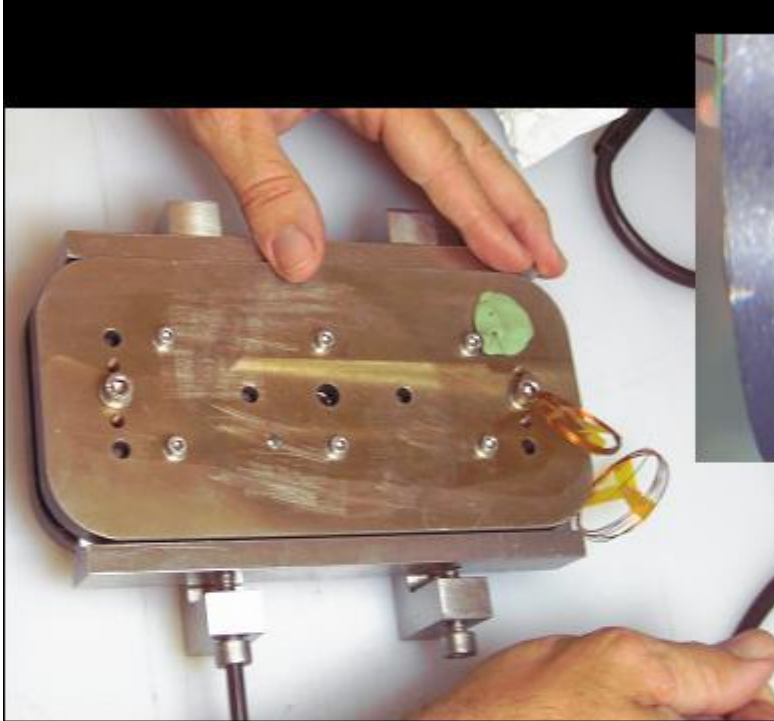
➤ *CLIC and its Test Facility CTF3:*

Corrector magnets, septa, kickers for CTF3 (CERN)

Micro-movers for TBL quads (CERN)

PETS for the TBL in CTF3 and the 1st module of CLIC (CERN)

Fabrication of XFEL superferric quads



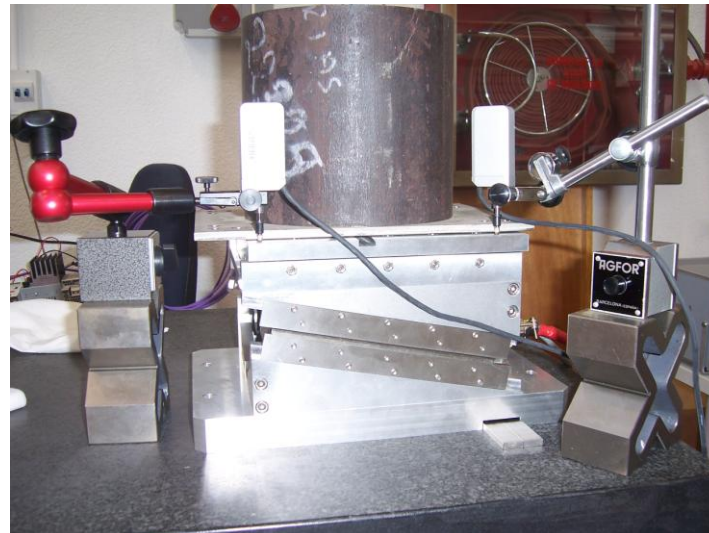
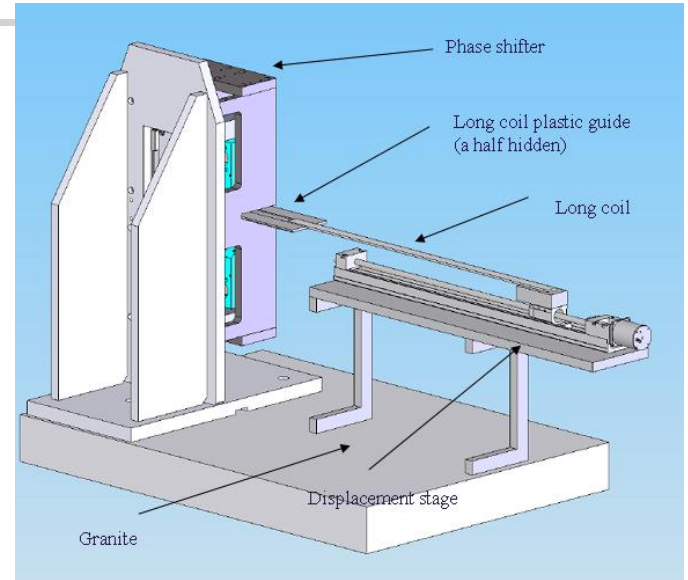
XFEL Intersections



Phase Shifter Prototype

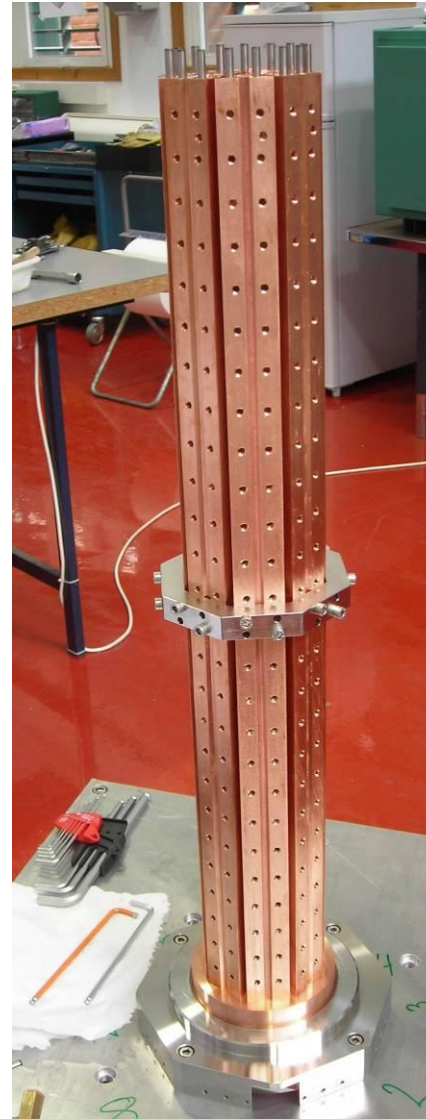
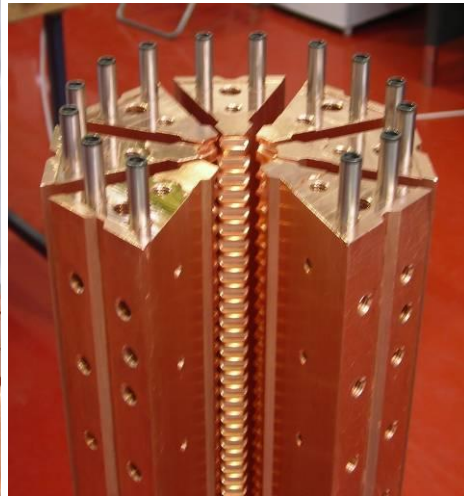
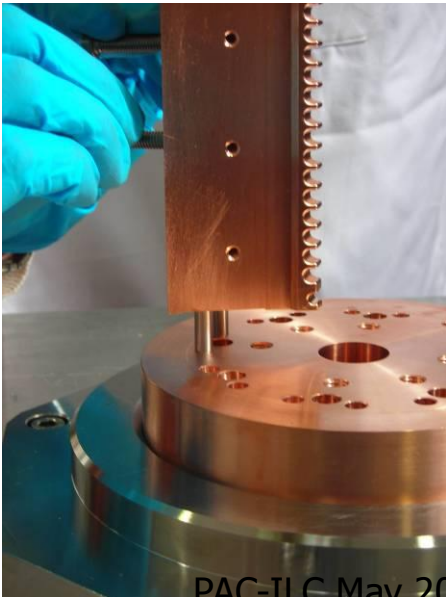
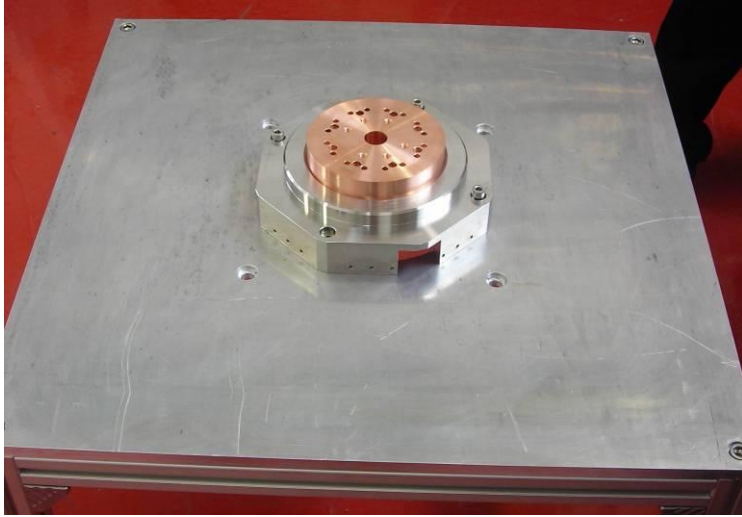
PAC-ILC May 2010

Measurement bench 3D Model



Quadrupole mover with integrated LVDT's under tests

PETS structure assembly



Accelerator R&D for FLC at IFIC



Capabilities

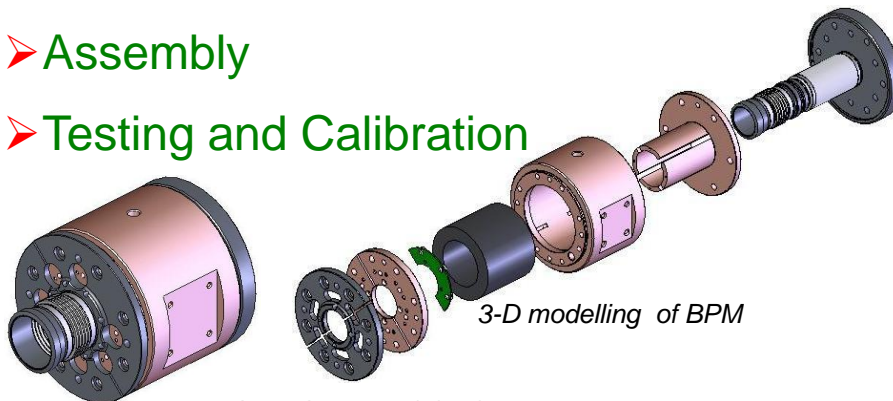
BEAM INSTRUMENTATION :

- CALCULATION

- Electromagnetic analysis
 - Electric circuits & electronics
- Mechanical analysis

- PROTOTYPING

- Design: tooling, drawings
- Fabrication follow-up
- Assembly
- Testing and Calibration

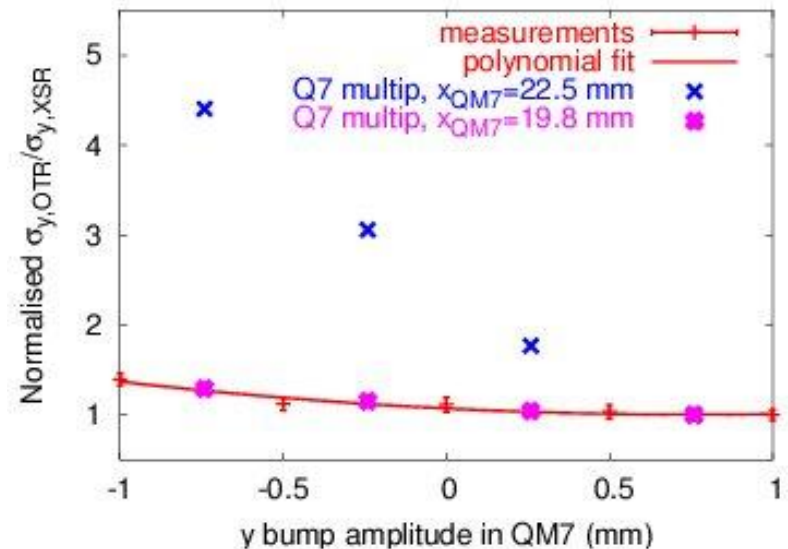


PAC-ILC May 2010

BEAM DYNAMICS:

- Optics design
- Non-linear dynamics studies
- New instrumentation techniques
- Commissioning

Emittance simulations and measurements in ATF





Main ongoing projects

➤ ***ILC and its Test Facilities:***

Beam dynamic studies and commissioning of ATF EXT line (LAL, KEK, SLAC)

Multi-OTR system for ATF2 (SLAC, KEK)

BPM supports with micromovers for FONT4 in (KEK, JAI)

BDS instrumentation studies

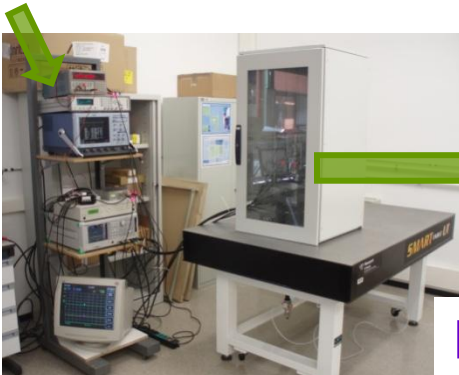
➤ ***CLIC and its Test Facility CTF3:***

BPM's for the TBL in CTF3 (UPC, CERN, Applied Physics-UV)

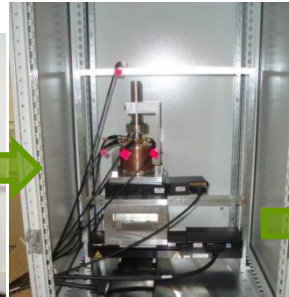
Drive Beam BPM's for the 1st CLIC module (CERN)

The CLIC and its Test Facility CTF3

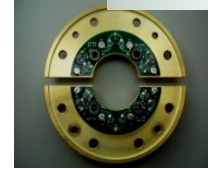
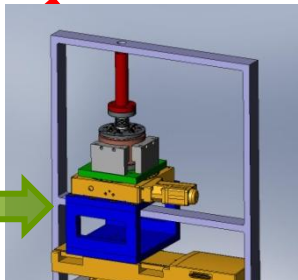
Control and DAQ equipment for all the setup signals



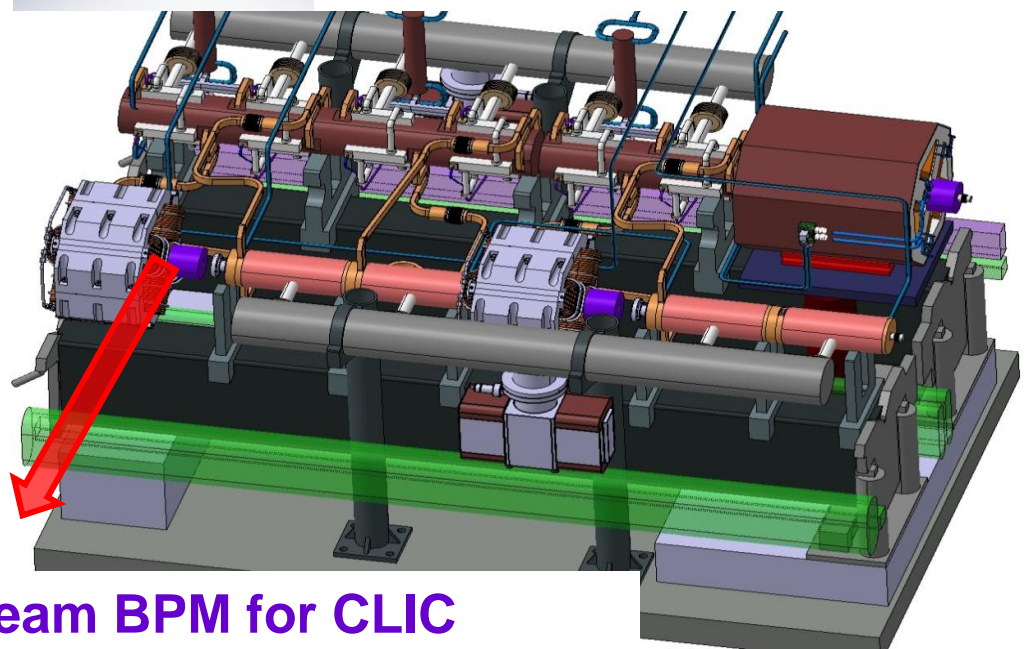
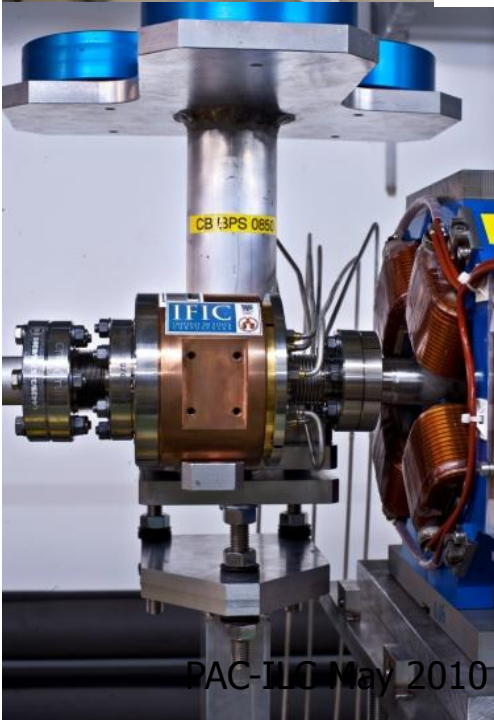
Low-frequency wire set-up



3D view design



BPS for TBL at CTF3



Drive beam BPM for CLIC

Accelerator R&D for FLC at UPC

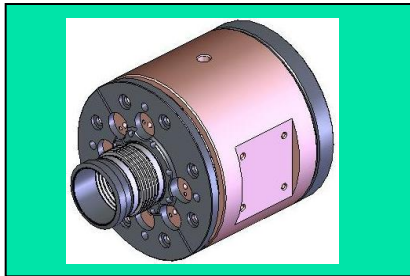


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Main ongoing projects

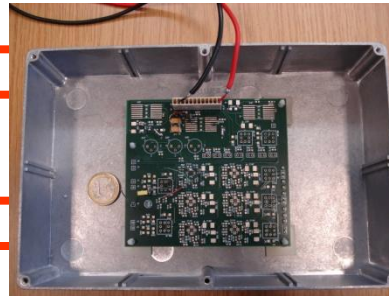
The BPS amplifiers for TBL of CTF3

Inductive pick-up



H

V



ΔH

ΔV

Σ

DIGITIZER



AFE:
Analog
Front-end
Electronics



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Main ongoing projects

➤ *The balance for all this collaboration project has been very positive:*

New capabilities have been created in the Spanish institutes which are being used for other facilities

Spanish companies having produced these devices for first time in our country are in position to participate in the industrialisation in a future



Future projects

- *The goal is to consolidate these contributions joining the effort of ILC for the EDR and CLIC for the CDR in a coordinated way:*

ILC and its test facilities: HTc superconducting quads with indirect cooling for MLI, Dipole mode cavity BPM for ILC cryomodule, multi-OTR in ATF2 EXT line, micromovers for FONT4 in ATF2

CLIC and its test facility CTF3: PETS for 1st CLIC module, BPMs for drive beam injector and Drive Beam Decelerator for the CLIC modules

**Thanks to Fernando Toral and
the Ciemat Accelerator group
for helping in the preparation**

Thanks for your attention