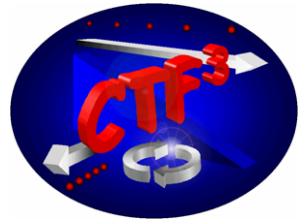
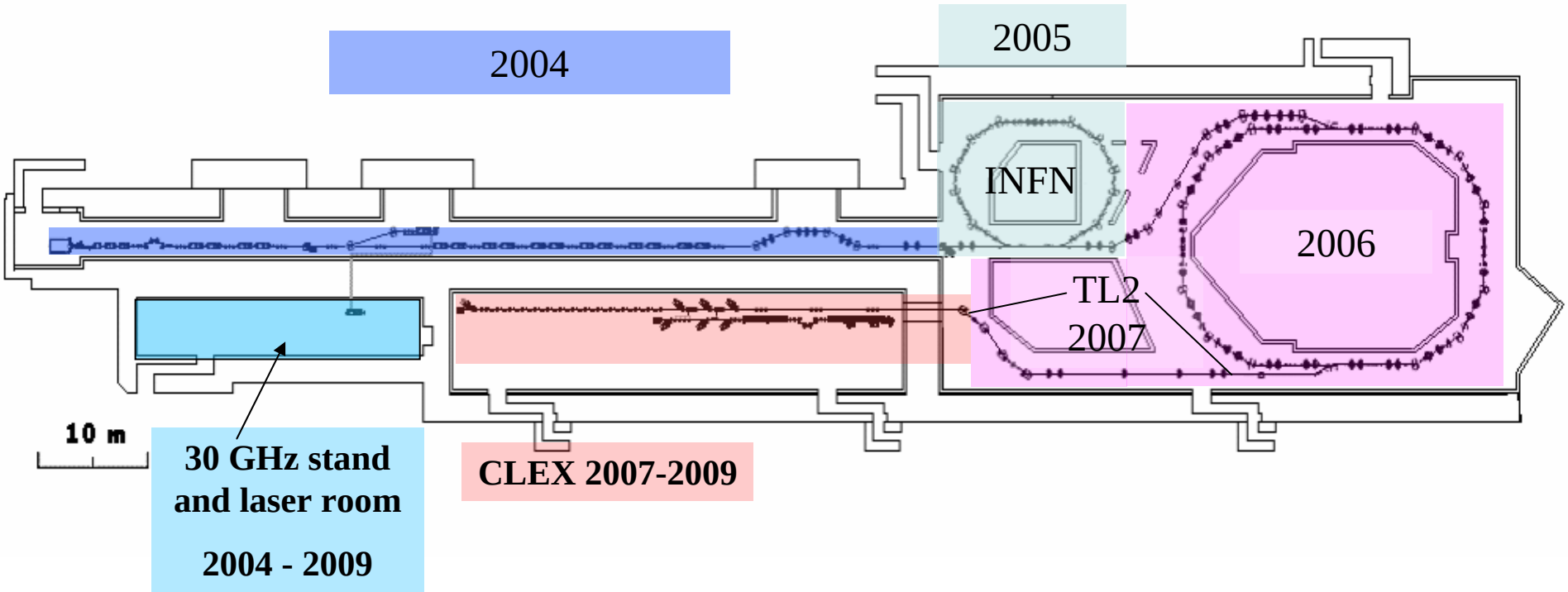


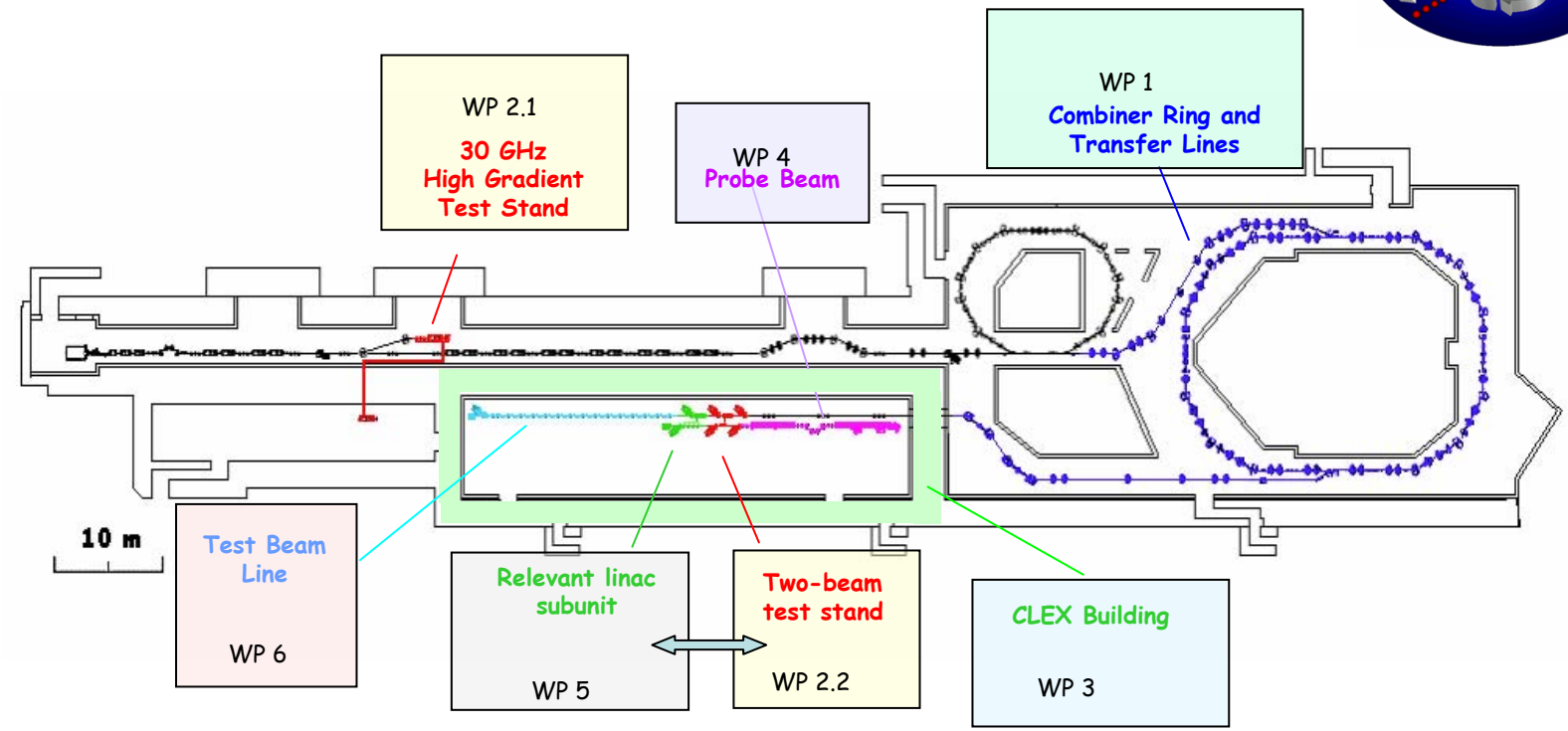

# Status of work package commitments

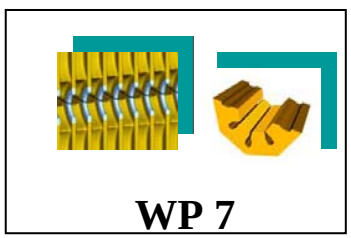
G.Geschonke
CERN

# CTF3 programme



# Work packages



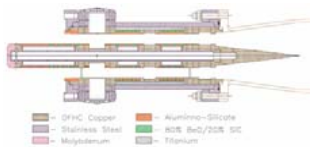



**WP 7**

**Structures**

**WP 8**

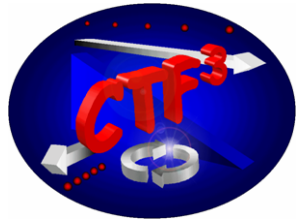
**CTF3 Operation**



**WP 9**

**30 GHz power source**

# Status of existing / past collaborations




**LAL**: Gun for Preliminary phase
HV for gun, pulser and control electronics,
pre-bunchers

**SLAC**: Gun on loan, Design of Injector,
participation in commissioning

**Uppsala University**: Operations support,
Phase monitor

**RAL**: Laser development for photo injector ,

**Turkey**: Operations support

**CARE-ELAN:** CTF3 workshop

**INFN**: Participation in
operation/commissioning
RF deflectors 3 GHz
Delay Loop : full responsibility
Bunch length chicane,
longitudinal diagnostics experiment

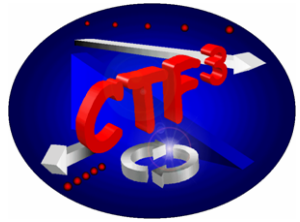
**Northwestern University Illinois**:
Drive Beam accelerator structure
Beam loss monitoring

**Finnish Industry**: One person for CLIC/CTF3

Many **CERN** groups

***Photo injector (partly funded by CARE/PHIN)***
LAL: RF gun
RAL: Laser
CERN: Photo cathodes

# Accelerated programme – contacts and discussions




**Finland**

Discussions with **Finnish Industry**

**Power converters**: latest February 2006

Discussions / specifications

*prototyping*

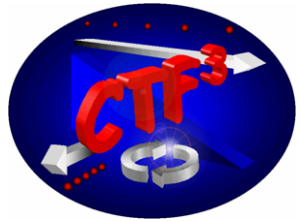
**RF structure (30 GHz)** ongoing development

technology – bimetal (WP 7.3)

*engineering support (person)*

*manufacturing technology development, 3-D machining*

# Accelerated programme – contacts and discussions




## France

**Probe Beam** latest February 2007

several discussions with **CEA-Dapnia, IN2P3 - LAL, ( - LAPP)**

*full responsibility for Probe Beam including gun (photo injector? laser ? )*

*use existing material from LPI as far as possible*

**Electronics for CR Beam Position monitors** **LAPP**

April 2006

specifications defined

*very interesting novel approach could be developed*

**Magnets for Combiner Ring** **LURE**

Nov 2005

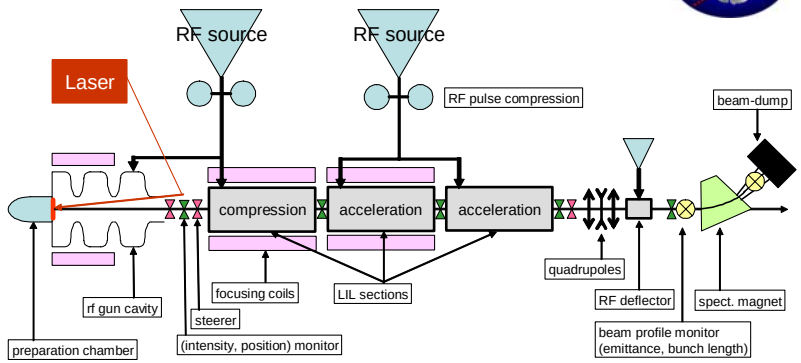
*32 Super-ACO quadrupoles*

**Automated test stand**

required during whole operations period from now on

Discussions with **DAPNIA**

**preferred scheme**




*comments : focusing magnets, number of diagnostics and steerers determined after complete simulations*

# Accelerated programme – contacts and discussions

## Italy

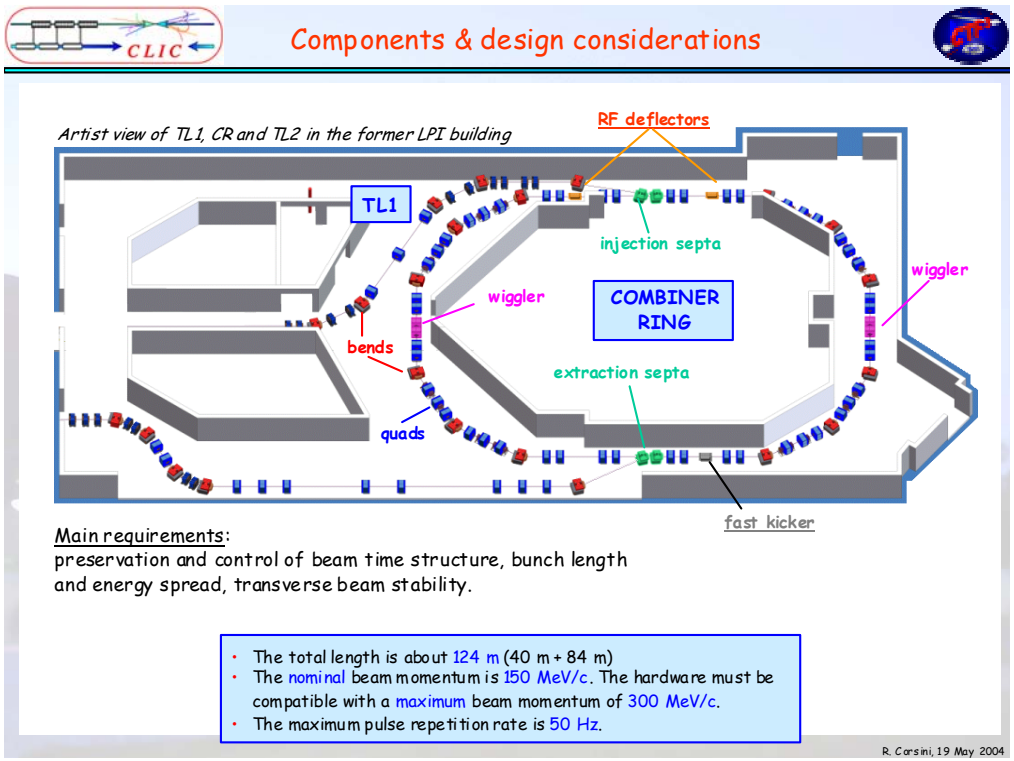
**Combiner Ring optics, design, vacuum system, path length wigglers**

Very well established collaboration with **INFN/LNF**

*optics very well advanced, such that components can be defined*

*one path length wiggler ordered*

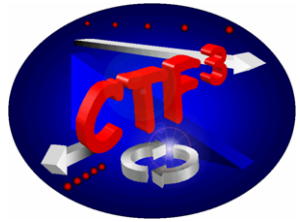
*vacuum chambers for CR and TL1 and TL2, incl. Beam diagnostics (w/o electronics)*




CR installed and commissioned in 2006

R.Corsini CTF3 collaboration meeting

# Accelerated programme – contacts and discussions




**Japan**

**High gradient structure work with KEK**

---

**Poland**

**Software develpopment Institute of Applied Mechanics of the Cracow University of Technology**

*Interface between HFSS and ANSYS*

---

**Russia**

**Magnet manufacture for CR in collaboration with BINP** November 2005

*already ordered 11 quadrupoles, 26 sextupoles*

**Work for 30 GHz programme**

Discussions with **IAP**

*stand-alone 30 GHz power source development*

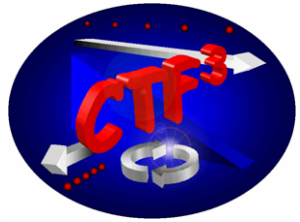
*Surface heating tests*

**JINR**

**Software for automatic conditioning**

*one physicist already working*

# Accelerated programme – contacts and discussions




**Spain**

Several discussions with **CIEMAT and Industry**

**Equipment for Combiner Ring** installed for start-up in spring 2006

***Corrector magnets***

*already being manufactured*

***2 double septum magnets***

*based on modified Daphne design, CERN collaboration*

*CERN will supply power supply*

***Ejection kicker for CR*** *design with collaboration from INFN/LNF*

*Pulser in collaboration with LLNL and CERN*

**Equipment for TBL** April 2007

*TBL quadrupoles with precision movers*

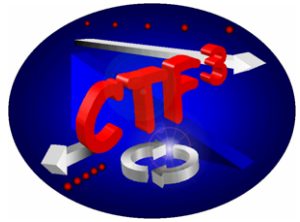
**RF structure work** ongoing development. Before end 2006

*Develop and build one PETS structure for TBL in collaboration with CERN*

## SPANISH COLLABORATION DELIVERABLES TO CTF3

| ITEM | DESCRIPTION | DEADLINE |
|---|---|---|
| Correctors | 33 H/V Orbit Correct Magnets for the Delay Loop and Transfer Lines. (Existing design) | July -2005 |
| Septa | 2 Double Septa Magnets for the Delay Loop (Only a reference design) | Dec-2005 ??? |
| Kickers | 2 "Stripline" Extraction Kickers (Only a reference design) | Oct-2006 ??? |
| TBL Quads | 15 Quadrupole Magnets with motorised support structure for the Test Beam Line | Mid-2007 |
| PETS | 1 Power Extraction Transfer System Prototype | Dec-2006 |



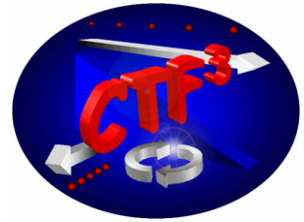



Luis Garcia-Tabarés
CTF3 Collaboration Meeting, 24/11/2004

## SPANISH COLLABORATION WORKINGPLAN

| TASKS | 2004 | 2005 | | | | | | | 2006 | | | | | | | 2007 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | J | M | M | J | O | N | J | M | M | J | O | N | J | | | | | |
| 0.1 "COMPL. ACTION" REQUEST | | | | | | | | | | | | | | | | | | | |
| 0.2 "COMPL. ACTION" APPROVAL | | | | | | | | | | | | | | | | | | | |
| ***CORRECTORS*** | | | | | | | | | | | | | | | | | | | |
| 1.1 DRAWINGS & TOOLING | | | | | | | | | | | | | | | | | | | |
| 1.2 FABRICATION | | | | | | | | | | | | | | | | | | | |
| ***SEPTA*** | | | | | | | | | | | | | | | | | | | |
| 2.1 DESIGN | | | | | | | | | | | | | | | | | | | |
| 2.2 DRAWINGS & TOOLING | | | | | | | | | | | | | | | | | | | |
| 2.3 FABRICATION | | | | | | | | | | | | | | | | | | | |
| ***KICKERS*** | | | | | | | | | | | | | | | | | | | |
| 3.1 CALCULATION | | | | | | | | | | | | | | | | | | | |
| 3.2 DESIGN | | | | | | | | | | | | | | | | | | | |
| 3.3 DRAWINGS & TOOLING | | | | | | | | | | | | | | | | | | | |
| 3.4 FABRICATION & TESTS | | | | | | | | | | | | | | | | | | | |
| ***TBL QUADS.*** | | | | | | | | | | | | | | | | | | | |
| 4.1 MAGNET DESIGN | | | | | | | | | | | | | | | | | | | |
| 4.2 STRUCTURE DESIGN | | | | | | | | | | | | | | | | | | | |
| 4.3 MAGNET DRAWINGS | | | | | | | | | | | | | | | | | | | |
| 4.4 STRUCTURE DRAWINGS | | | | | | | | | | | | | | | | | | | |
| 4..5 MAGNET FABRICATION | | | | | | | | | | | | | | | | | | | |
| 4.6 STRUCTURE FABRICATION | | | | | | | | | | | | | | | | | | | |
| 4.7 ASSEMBLY & TESTS | | | | | | | | | | | | | | | | | | | |
| ***PETS*** | | | | | | | | | | | | | | | | | | | |
| 5.1 CALCULATION & DESIGN | | | | | | | | | | | | | | | | | | | |
| 5.2 DRAWINGS | | | | | | | | | | | | | | | | | | | |
| 5.3 FABRICATION OF ONE OCTANCT | | | | | | | | | | | | | | | | | | | |
| 5.4 FABRICATION OF A PROTOTYPE | | | | | | | | | | | | | | | | | | | |

Louis Garcia-Tabares
Collaboration meeting 2004



# CTF3 Kickers and Septa

## Conclusions

A solution is proposed for the DL septa using existing septa (ex $e^+$ and $e^-$ injection into EPA).

A collaboration are proposed with CIEMAT for the CR Septa using designs based on DAF NE and TERA.

A temporary solution is proposed for CR kicker using existing magnets and pulse generators (ex $e^+$ and $e^-$ injection into EPA).

A final solution is proposed requiring collaborations with CIEMAT for the stripline magnet and Lawrence Livermore Lab for the pulse generator.

# Accelerated programme – contacts and discussions

**Sweden**

Detailed discussions with **Uppsala University,**
resulting in a funding request to **Swedish Research Council**

**TL2 incl. bunch compressor**

*optics design, missing magnetic elements (6 dipoles) and power converters, beam diagnostic equipment,*

**Two Beam Test Stand**

*optics, magnets, vacuum, diagnostics (spectrometers, optical screens, BPMs, WCMs) , for Probe Beam and Drive Beam*

*RF diagnostics and data handling.*

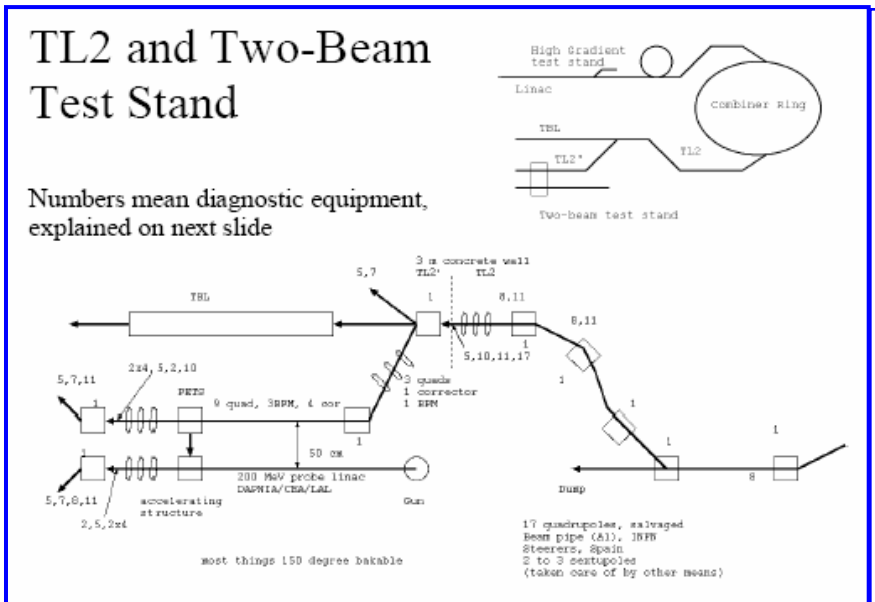
*(PETS and accelerating structures not included)*

To be commissioned in 2007

**Magnets and power supplies from Celsius**

*suitability being assessed*

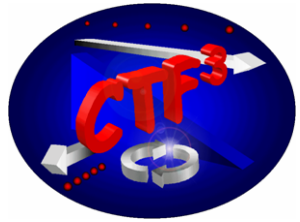
Volker Ziemann / CTF3 collaboration meeting




## Summary

- Plan to participate in the build-up the high gradient test stand.
- Transfer that know-how to the **Two-Beam test stand** and build it.
- Optimize and build the transfer lines **TL2 and TL2'.**
- We're waiting for the decision from VR and Wallenberg Foundation.

# Accelerated programme – contacts and discussions




**Turkey**

**Accelerator operation (coordinated by Ankara University)**

*Turkish Universities send graduate students to participate in operation.*
*The first student has finished the first three months*

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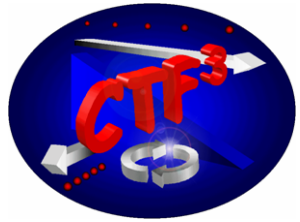
**UK**

**Stand alone 30 GHz power source (Strathklyde)**

**Beam Diagnostics RHUL**

**Cockcroft Institute participation**

# Accelerated programme – contacts and discussions




**USA**

**A prioritized list of sub systems has been sent to the US coordinator and DOE**

**Beam Diagnostic equipment for TBL Northwestern University Illinois** to be commisisoned in 2007

*proposal drafted*

**Pulser for fast kicker LLNL** to be installed in CR for start-up 2006

*very interesting technology, could be developed by LLNL or in collaboration with CIEMAT and CERN*

**30 GHz stand alone power source** at the lates in 2007

**Accelerating structure testing**

---

**CERN**

**Combiner ring magnets (with BINP)**

**CLEX building,**

**Accelerating / PETS development**

**Operation, maintenance, exploitation,**

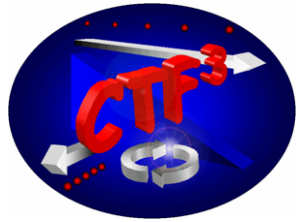
**Project management**

**CLIC / CTF3 accelerated programme 27.1.2005**

| Work Packages | | Participation | | | Resources | | status | delivery | commitment = start |
|---|---|---|---|---|---|---|---|---|---|
| | | | | % missing | M CHF | my | | | |
| **1. Combiner Ring (CR), Transfer Line (TL1) Transfer Line (TL2) Bunch compressor (BC)** | 1.1 Optics layout | CR and TL1 | CERN, LNF | | | | ok, ~finished | 4_2006 | confirmed |
| | 1.2 Magnets | Correctors | Ciemat | | | | ok (started) | 11_2005 | done |
| | | 32 quadrupoles | Lure | | | | Ministry ok pending | | |
| | | CR+TL1quads, sextupoles | BINP, CERN | | | | ok | | |
| | | TL2 + BC all missing magnets | Sweden | | | | | 2_2007 | 9_2005 |
| | 1.3 Vacuum system | CR, TL1, TL2 Chambers | LNF | | | | | 2-6_2006 2_07 (TL2) | 2_2005 5_2006 (TL1) |
| | | CR, TL1 pumps, gauges, electronics | CERN | | | | ok | | |
| | 1.4 Beam diagnostic equip. | Monitor chambers | LNF | | | | | 2_2006 | 2_2005 |
| | | BPM electronics development | LAPP | | | | | 4_2006 | 6_2005 |
| | | BPM electronics manufacture | | 100 | | | | | 1_2006 |
| | 1.5 Power Converters | all magnet power supplies | Finnish Industry | | | | | 2_2006 | 5_2005 |
| | 1.6.Technical sevices & installation | Infrastructure, Installation support | CERN | | | | | 4_2006 | 11_2005 |
| | | outside Installation support | | 100 | | | | | |
| | 1.7. Control & software | | CERN | 50 | | | | 4_2006 | 11_2005 |
| | 1.8. Fast kicker & pulser septa | Stripline kicker, septa | Ciemat (LNF support) | | | | | 3_2006 temp solution for kicker possible | 3_2005 |
| | | Pulser | Ciemat CERN (support) | | | | | | |
| | | | LLNL | | | | | | |
| | 1.9. RF distribution system | 3 GHz waveguides | CERN | | | | ok | 11_2005 | 6_2005 |
| | TL2 Transfer line | optics | Sweden | | | | | 4_2007 | 4_2006 |
| | | magnets, Power converters | Sweden | | | | | 1_2007 | 6_2005 |
| | | Beam diagnostics | Sweden | | | | | 2_2007 | 2_2006 |
| | | TL2 pumps, gauges, electronics | Sweden | | | | | 2_2007 | 7_2006 |
| | | magnets, Power converters | Sweden(Celsius) | | | | | 10_2006 | 5_2005 |

| Work Packages | | Participation | | | Resources | | status | delivery | commitment = start |
|---|---|---|---|---|---|---|---|---|---|
| **2. 30 GHz RF power test stand** | 2.1. Automated test stand | Software | Dapnia | | | | | | |
| | | | JINR | | | | | 4_2005 => | ongoing |
| | | Hardware | Sweden | | | | | 2006 | 5_2005 |
| | 2.2. Two-beam test stand | beam line, diagnostics | Sweden | | | | | 2_2007 | 6_2005 |
| | 2.3. 30 GHz RF pulse compression | | CERN / Gycom | | | | ok | 5_2005 | ongoing |
| **3. CLEX building** | | | CERN | | | | ok | 2006 | 2005 |
| **4. Probe beam linac** | | | DAPNIA | | | | | 2_2007 | 5_2005 |
| | | | LAL | | | | | | |
| **5. CLIC linac unit** | | PETS and accelerating structures | | 100 | | | | 5_2008 | 2005 |
| **6. 35 A Test beam line (TBL)** | | quadrupoles & precision movers | CIEMAT | | | | | 4_2007 | 6_2005 |
| | | Beam line design | | 100 | | | | 1_2007 | 1_2006 |
| | | PETS | | 100 | | | | 5_2007 | 6_2005 |
| | | Diagnostics equipment | NWU | | | | | 1_2007 | 1_2006 |
| | | | RHUL | | | | | | |
| **7. 30 GHz structure development** | 7.1. Accel. structure | Design | CERN | ? | | | ok | 2005-2009 | as soon as possible |
| | | | Poland | | | | | | |
| | 7.2.PETS | Prototype development (one) | CIEMAT | ? | | | | | |
| | | Design | CERN | | | | ok | | |
| | 7.3. Structure technology | | Finland | ? | | | | | |
| | | | Spain | | | | | | |
| **8. CTF3 operation** | | one graduate sudent during operating periods | Turkey | 90 | | | | 2005-2009 | as soon as possible |
| | | | CERN | | | | ok | | |
| **9. 30 GHz stand-alone source** | | | Strathclyde | 100 | | | | 2007 | 2005 |
| | | | IAP | | | | | | |
| | | | US | | | | | | |

# Conclusion




- Programme assured up to including Delay Loop

- With new collaborations Combiner Ring assured,
  TL2 and Two Beam test stand ok
  Probe Beam ok

- Some major items still missing collaborators
  Beam Positoin monitors,
  TBL,
  Operation,
  stand alone power source

- Completion within time scale possible with more collaborations

| | Resources | | |
|---|---|---|---|
| | CHF | m y | Funding decision |
| **Italy, INFN/LNF**<br>already very well established collaboration for magnetic bunch lengthener/compressor and Delay Loop.<br>**(beyond DL):**<br>Optics design for CR and TL1 going on between CERN and LNF.<br>Path length wigglers for CR<br>Vacuum chambers for CR, TL1 and TL2 including beam diagnostics (without electronics) | | | |
| **Sweden**<br>Detailed technical discussion on 2.9.04<br>Interest in TL2 incl. bunch compressor and Two Beam Test Stand.<br>TL2 + BC: optics design, missing magnetic elements (6 dipoles) and power converters, beam diagnostic equipment,<br>TB Test stand: optics, magnets, vacuum, diagnostics (spectrometers, optical screens, BPMs, WCMs, for Probe Beam and Drive beam), RF diagnostics and data handling.<br>*PETS and accelerating structure not included.* | | | |
| **Spain:**<br>Two visits from Spanish delegations. Proposal:<br>Ciemat will build corrector magnets (independent of approval of the rest of the programme.<br>In addition:<br>2 double septum magnets for CR, based on scaled DaΦne design. CERN can refurbish the required power supply<br>Ejection kicker for CR: Select the originally proposed strip-line kicker ( LNF). A new fast pulser is required, possibly to be built in collaboration with LLNL and CERN<br>TBL quadrupoles with precision movers<br>RF structure work: Ciemat will establish RF team from plasma physics. Send someone to CERN to learn the computing/measurement technology. Ideal aim (t.b.c.) build one PETS for the TBL. | | | |
| **Finland**<br>Interested in power converters for the CR and in technology for accelerating structure.<br>Discussion with the Finnish ILO at CERN.<br>Requirements and Specs for power converters defined, Job description of engineer to steer the Power converter procurement | | | |

| | | | |
|---|---|---|---|
| **France**<br>**CEA/LAL/LAPP**<br>Several discussions at CERN to define technical details of:<br>Complete Probe beam linac for CLEX. Additional klystron(s) and modulator(s) required<br>**LAPP**<br>Electronics for beam position monitors for CR. Technical details discussed.<br>**LURE**<br>32 quadrupole magnets from Super ACO | | | |
| **United Kingdom** | | | |
| **USA**<br>**NW University Illinois**<br>Preparation of proposal for beam diagnostics for TBL in preparation.<br>**LLNL**<br>fast pulser for CR ejection kicker<br>**SLAC** | | | |
| **Turkey**<br>Universities propose to send 4 physicists to participate in CTF3, mainly in operation. Each one will come twice for three months. The programme has started mid October 2004. | | | end 04 |
| **Russia**<br>**BINP**<br>quadrupoles and sextupoles are being ordered from BINP at special financial conditions. FC agreement obtained.<br>**IAP** | | | |
| **JINR** | | | |
| **Asia**<br>**KEK** | | | |
| **Poland** | | | |
| **CERN**<br>Combiner Ring magnets, CLEX building, Infrastructure, Operation, maintenance and exploitation, accelerating structure / Pets development, Project management, advance finance for not yet funded items on the critical path | | | |

# Planning

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| Drive Beam Accelerator | | | | | | |
| 30 GHz high-gradient test stand | | | | | | |
| 30 GHz high-gradient testing (4 months per year) | | | | | | |
| ***R1.1 feasibility test of CLIC accelerating structure*** | | | | | | |
| Delay Loop | | | | | | |
| Combiner Ring | | | | | | |
| ***R1.2 feasibility test of drive beam generation*** | | | | | | |
| CLEX | | | | | | |
| ***R1.3 feasibility test of PETS* structure*** | | | | | | |
| Probe Beam | | | | | | |
| ***R2.2 feasibility test of relevant CLIC linac sub unit*** | | | | | | |
| Test beam line | | | | | | |
| ***R2.1 Beam stability bench mark tests*** | | | | | | |