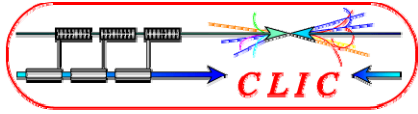


## The next steps for CTF3

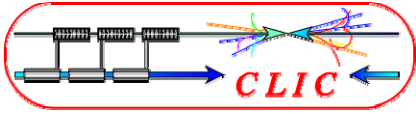
L. Rinolfi



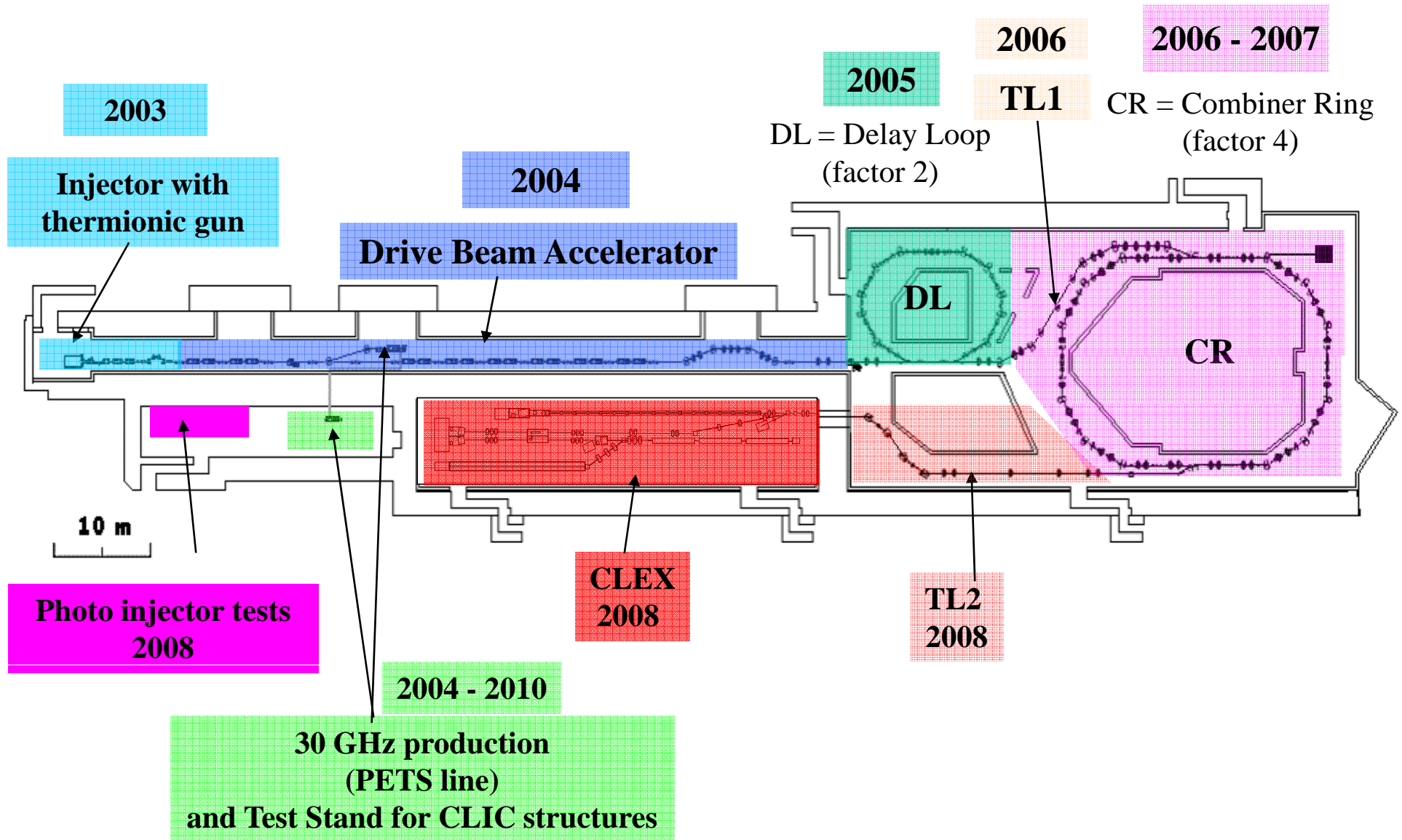
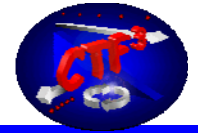
# Overview

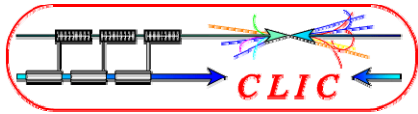


- Brief review of installations/consolidation in the present CTF3
- Review of new installations and tests for CTF3
- Planning for hardware tests and running time

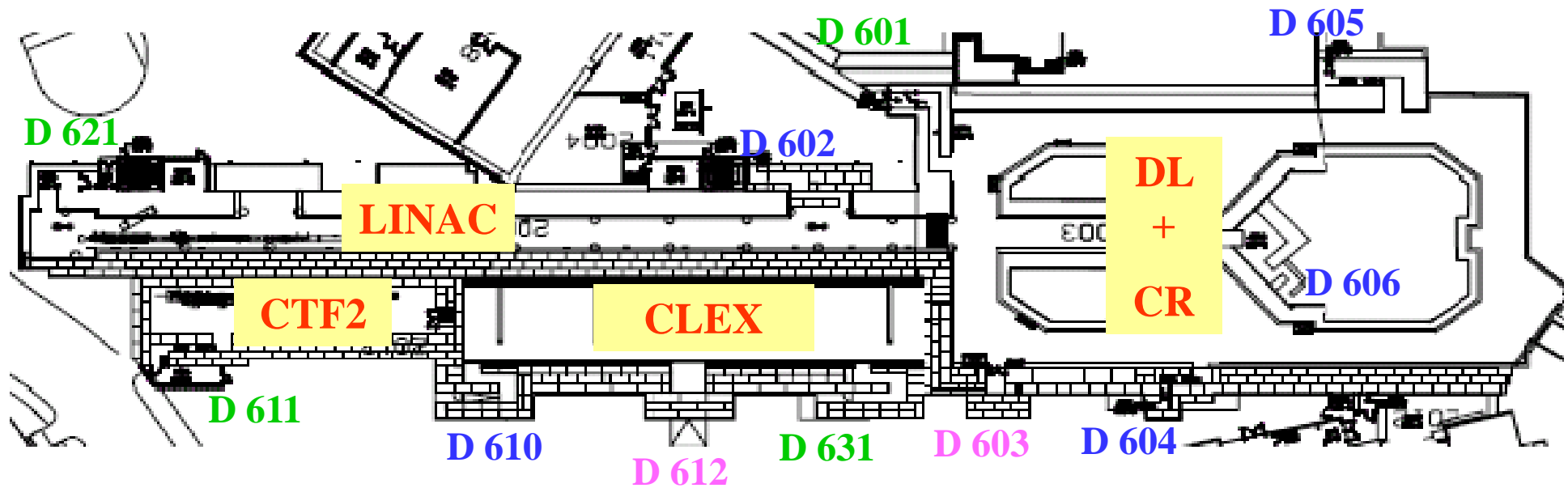


# CTF3 General Layout





# Machine areas under control access



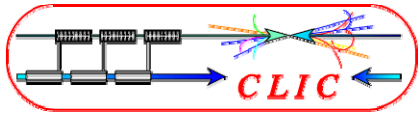
**D 6x1: Doors with access control**

**D 6xx: Safety issues**

**D 6xx: Doors closed with concrete blocks**

From March 2008, the 4 areas will have independent control access.

From September 2008 (Tail Clipper), work in CLEX will be possible while there will be beam in the Combiner Ring



# Injector Linac



## Thermionic gun

See *Existing hardware* talk

by F. Tecker

**First step:** Support required from LAL to fix where possible the issues related to regulation and electronics in order to increase the reliability of the gun.

**Second step:** Consolation program foreseen in the next future.

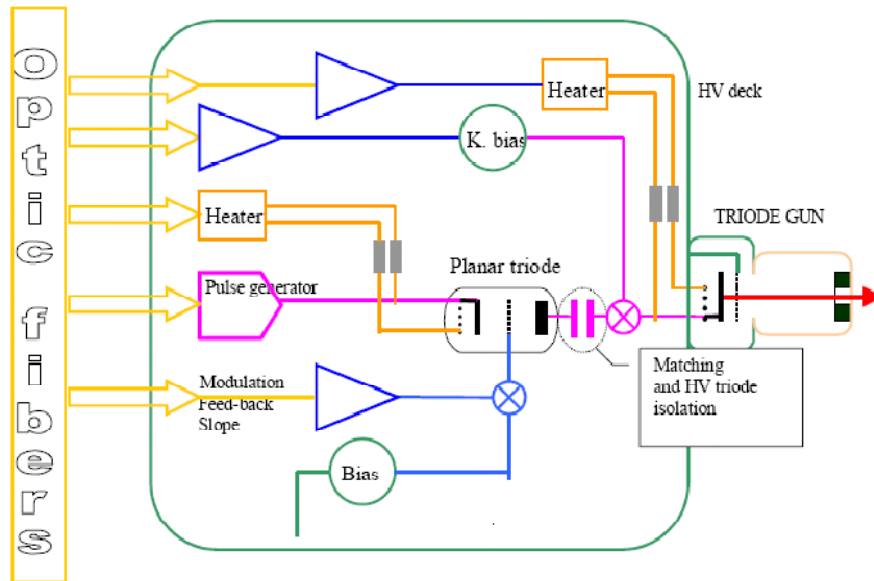
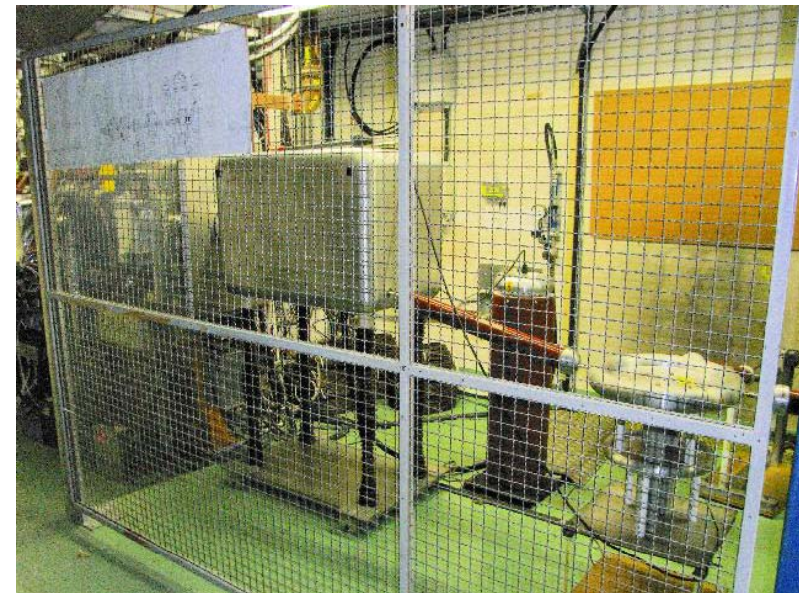
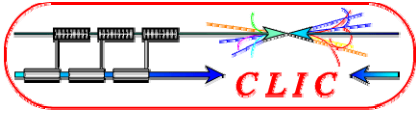
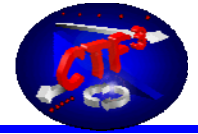


Figure 7.5 Schematic of the electronics for the gun.



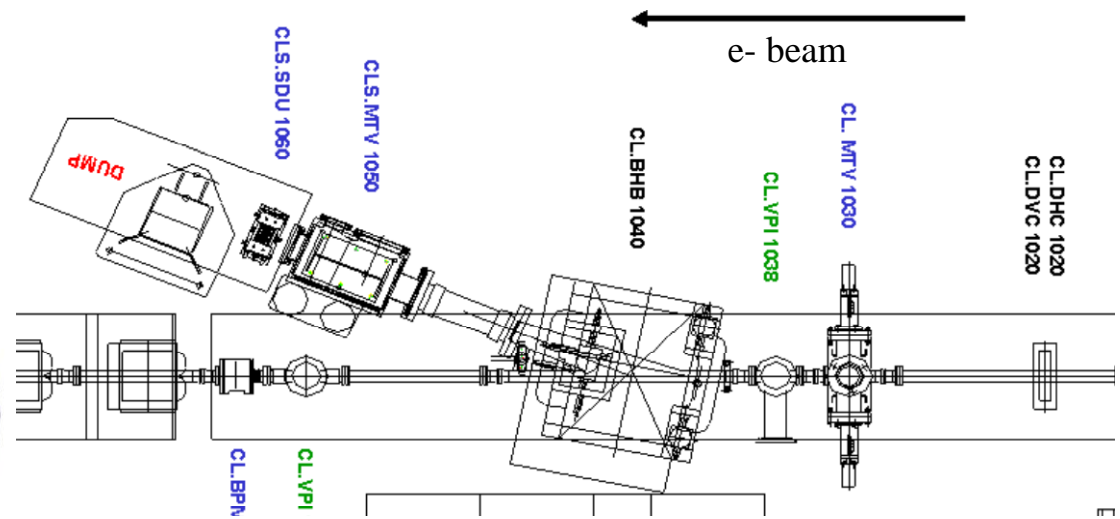
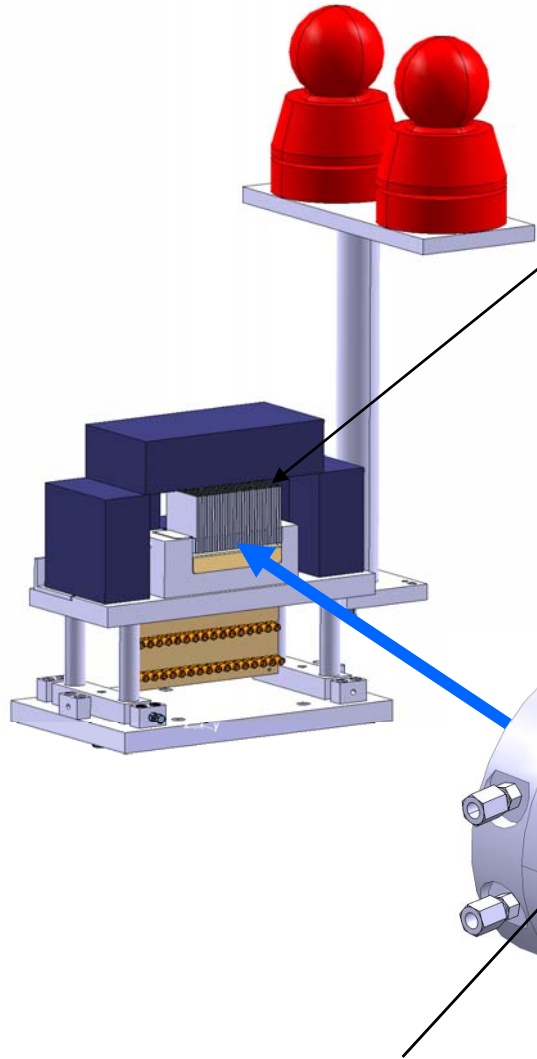


# Drive Beam Accelerator



## Segmented Dump CLS.SDU 1060

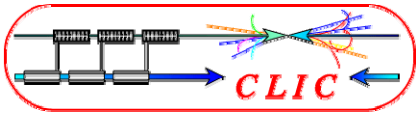
- 32 Tungsten plates (2mm thick) spaced by ~ 1mm
- Insulator in Alumina (radiation-hard)
- New Ceramic electronic card connected to the dump segments
- Alignment
- Connected to 50Ω to ground (increasing signal to noise ratio)



### • Collimator in Steel

- Mounted on the beam tube
- 32 vertical slits 400microns thick
- Water cooled

See *Profile monitoring* talk  
by T. Lefevre



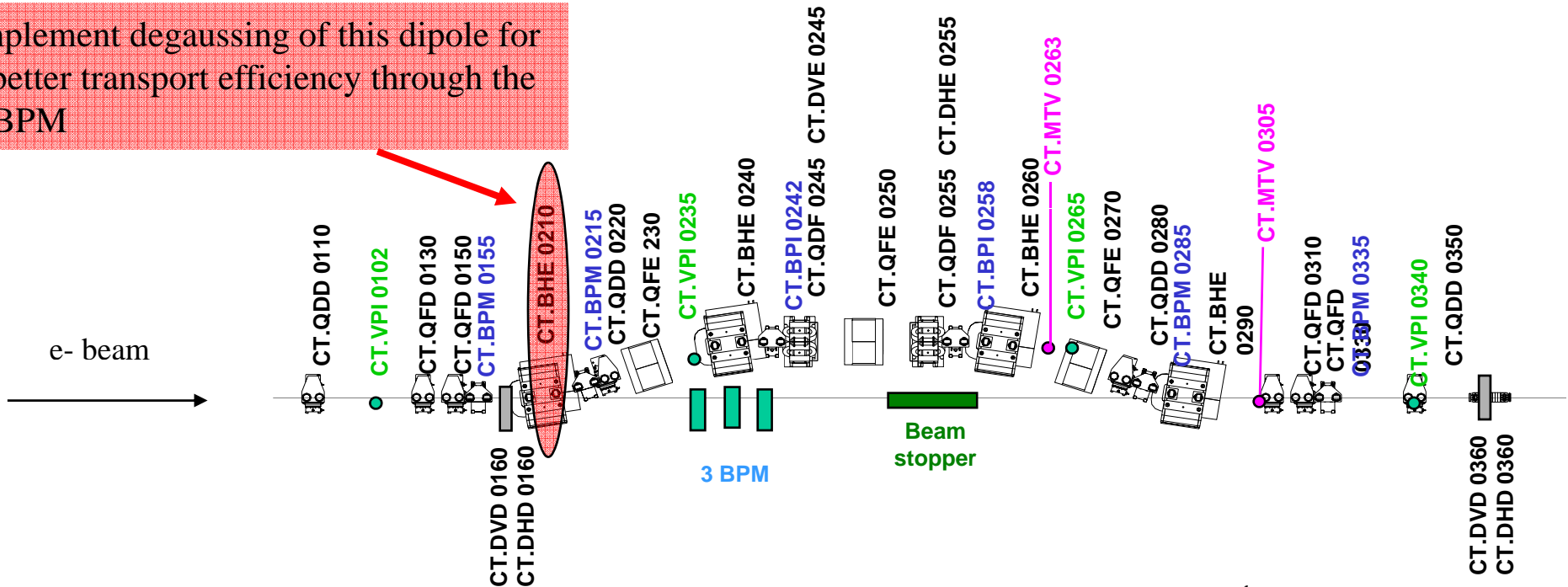
# Drive Beam Accelerator

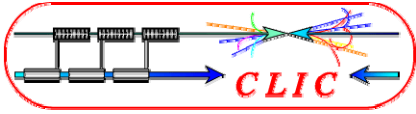


## Three BPM for EuroTeV

See *Electromagnetic monitors* talk  
by L. Soby

Implement degaussing of this dipole for a better transport efficiency through the 3 BPM



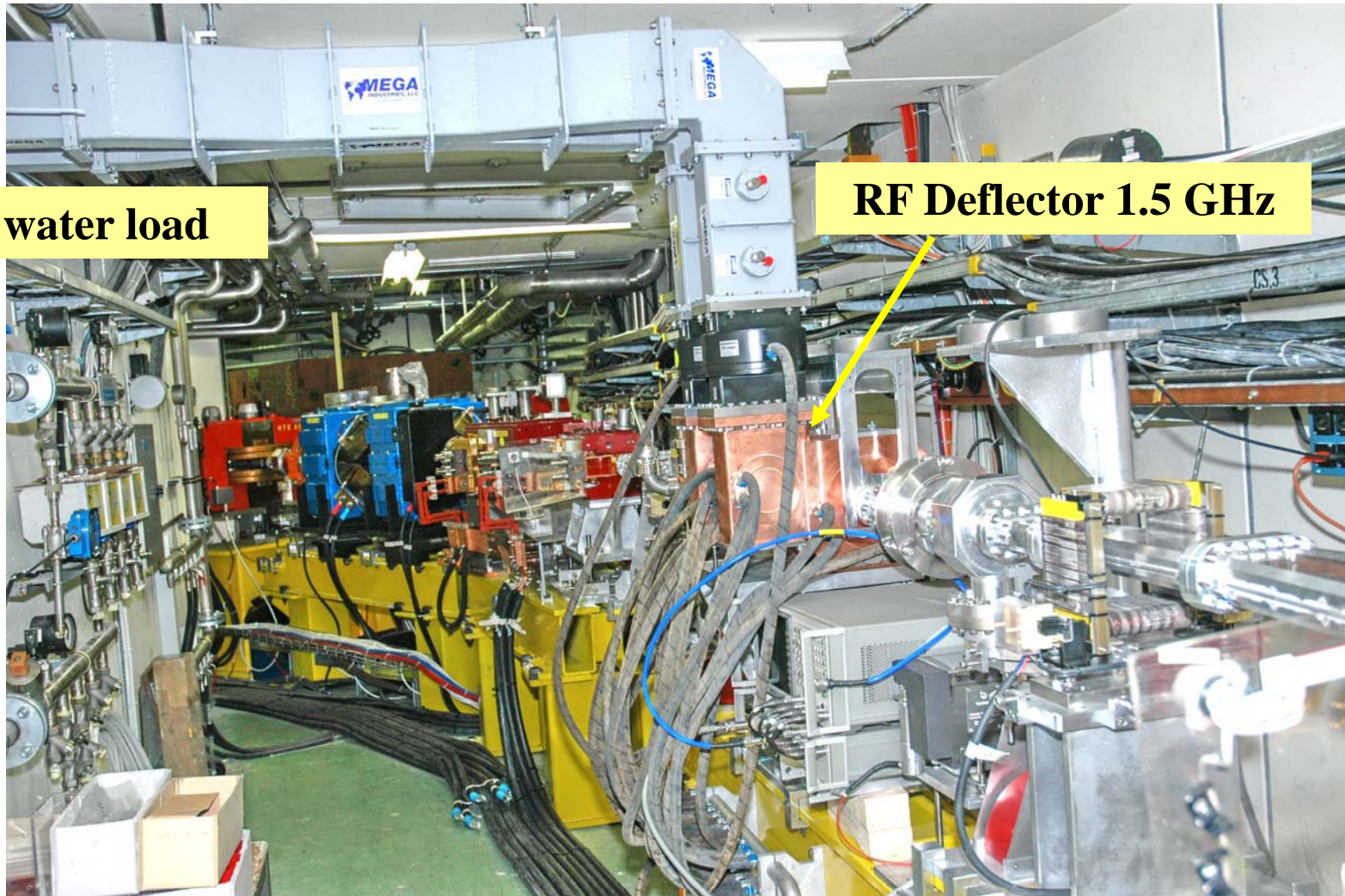


# Delay Loop

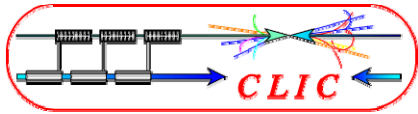


**New water load**

**RF Deflector 1.5 GHz**







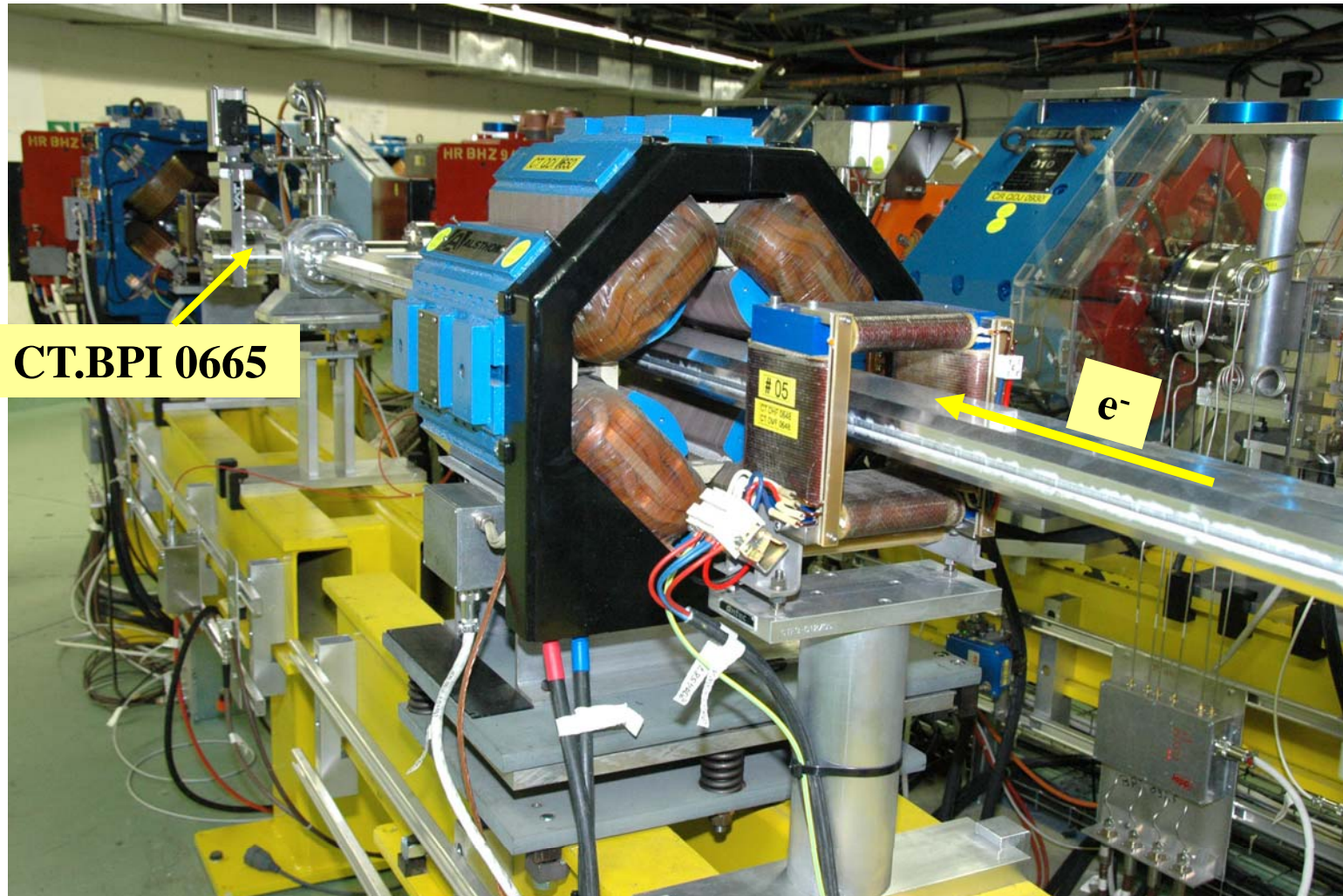
# Transfer Line TL1

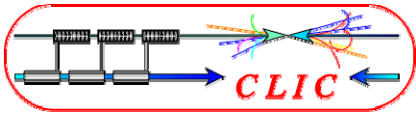


## Digital signal treatment for BPM

See *Status of LAPP BPM* talk

by L. Bellier





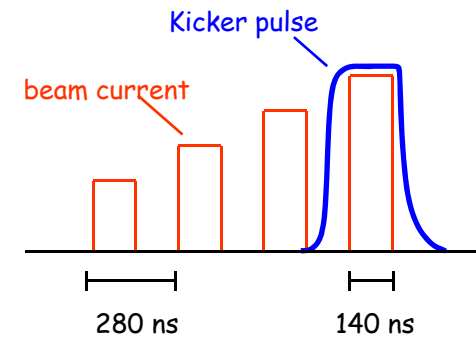
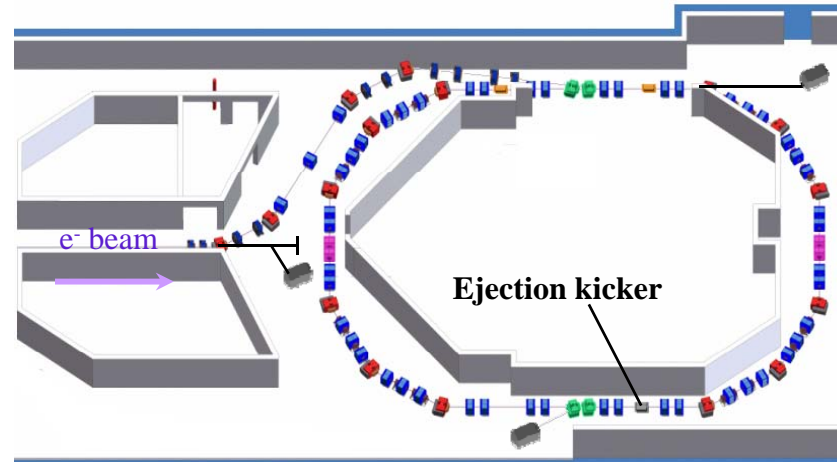
# Combiner Ring



| Parameters        | Units               |
|-------------------|---------------------|
| Aperture<br>H x V | 110 X 35<br>mm x mm |
| Field             | 0.0237 T            |
| Integ. Field      | 0.084 T. m          |
| Rise time         | 35 ns               |
| PFN<br>voltage    | 40 kV               |
| Current           | 660 A               |

## Type KHA:

From CERN / EPA



See *Kicker and pulsers at Ciemat* talk  
by I. Rodriguez

See *Kicker and pulsers at CERN* talk  
by M. Barnes

Tests done at INFN Frascati  
HV pulse test at 16kV, 5ns  
HV dc test at 18kV  
Ready to be installed



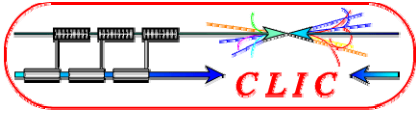
## Type KHB:

Designed and built by



January 2008





# Combiner Ring



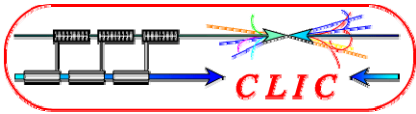
See *Commissioning status* talk  
by P. Skowronski

In order to cure the vertical instabilities, two new (3 GHz) RF deflectors (in Al) have been designed by LNF (Frascati) and are under construction.

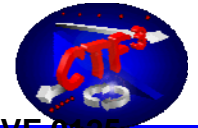
See *Instability-cure/Combiner Ring* talk  
by D. Alisini

They are foreseen to be installed in the machine during this shut-down

23<sup>th</sup> January 2008



# Transfer Line TL2

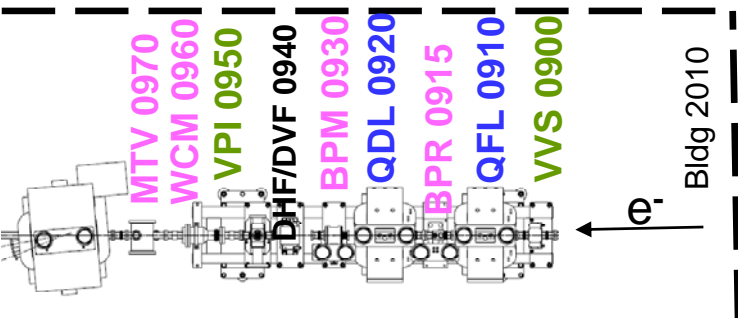
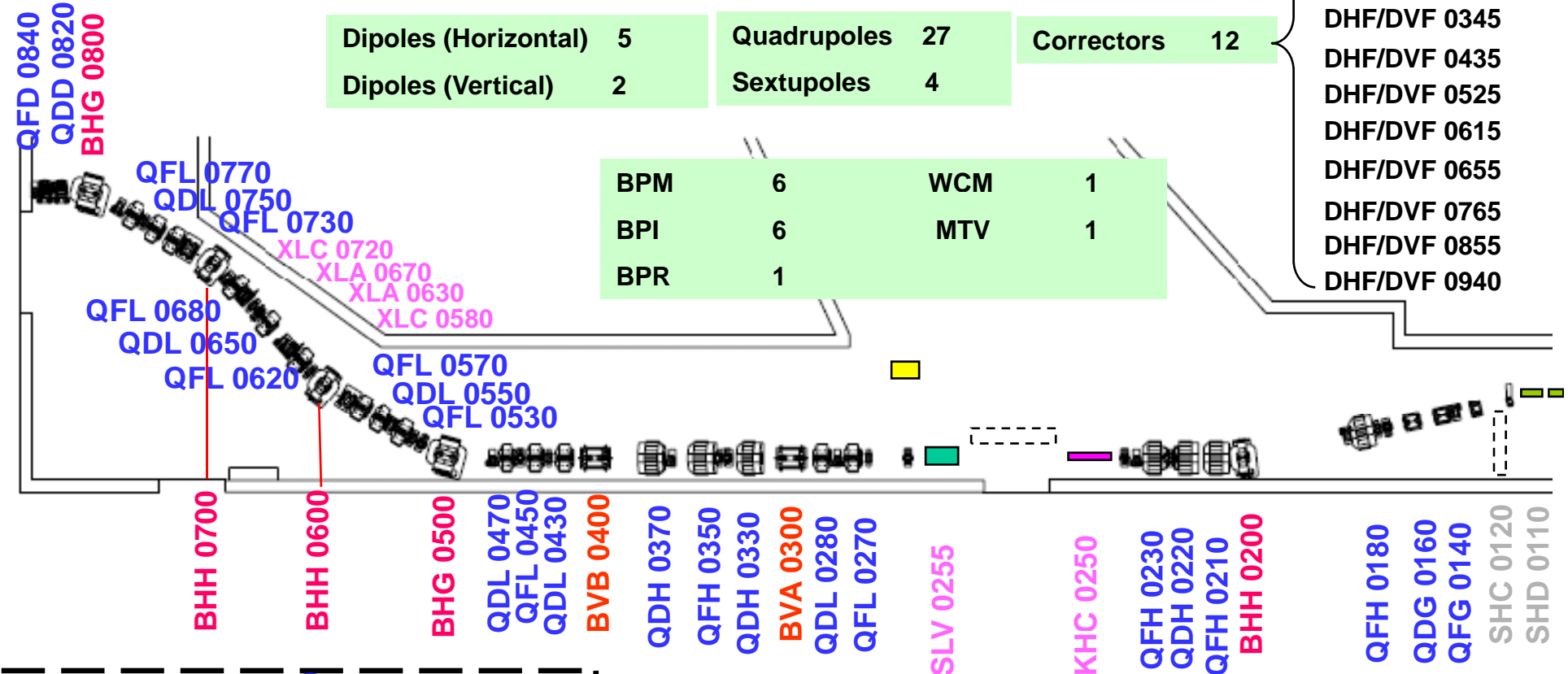


|     |   |
|-----|---|
| VPI | 9 |
| VVS | 2 |

|                      |   |             |    |            |    |
|----------------------|---|-------------|----|------------|----|
| Dipoles (Horizontal) | 5 | Quadrupoles | 27 | Correctors | 12 |
| Dipoles (Vertical)   | 2 | Sextupoles  | 4  |            |    |

|     |   |     |   |
|-----|---|-----|---|
| BPM | 6 | WCM | 1 |
| BPI | 6 | MTV | 1 |
| BPR | 1 |     |   |

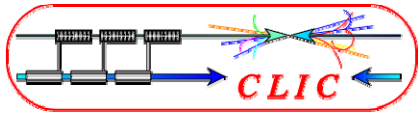
- DHF/DVF 0125
- DHF/DVF 0175
- DHF/DVF 0225
- DHF/DVF 0265
- DHF/DVF 0345
- DHF/DVF 0435
- DHF/DVF 0525
- DHF/DVF 0615
- DHF/DVF 0655
- DHF/DVF 0765
- DHF/DVF 0855
- DHF/DVF 0940



**CLEX**

L. Rinolfi

23<sup>th</sup> January 2008



# A good collaboration for TL2 line



**Ciemat - Spain:** Septa + correctors D\*F types + Tail Clipper

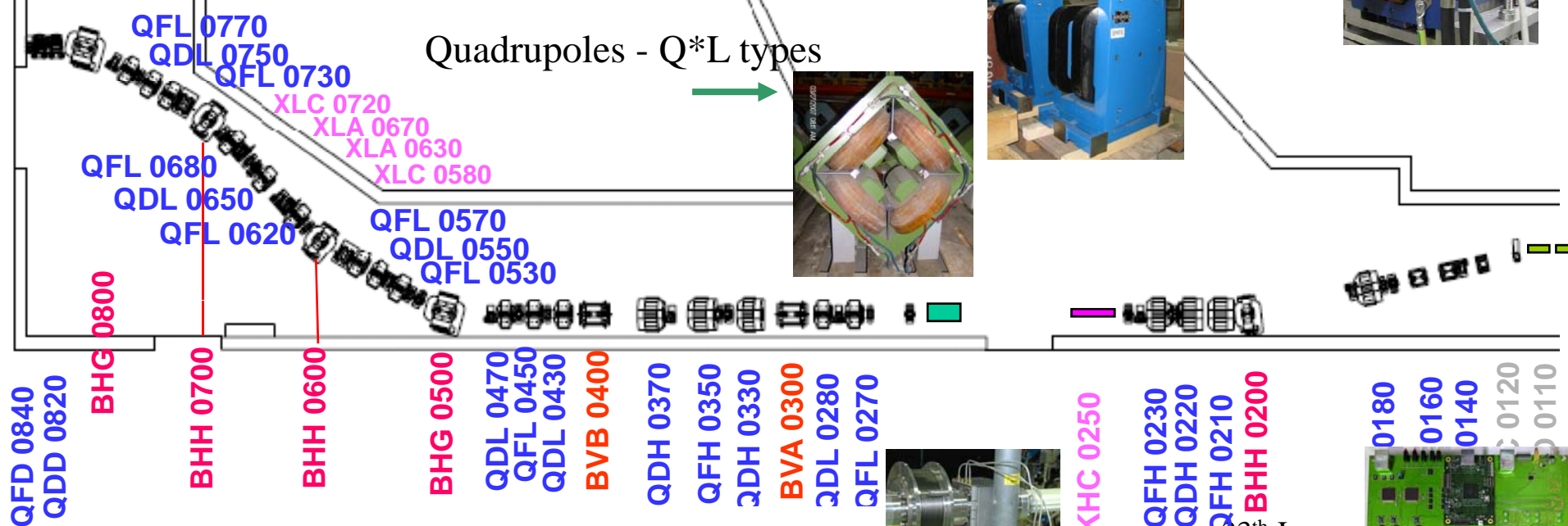
**BINP - Russia:** Quadrupoles - Q\*G types

**RRCAT- India:** Dipoles + Vacuum chambers

**LNF - Italy:** Ansaldo Sextupoles: X\*A types

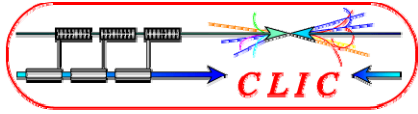
**CEA - France:** Scanditronix Quadrupoles: Q\*D types

**Uppsala- Sweden:** Celsius Dipoles BVA + BVB types



**LNF - Italy:** 6 BPM as BPI types

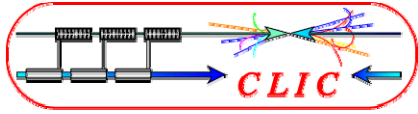
**LAPP** 23<sup>th</sup> January



# Magnetic measurements



| Place             | Type name | Origin       | Number | Dates             |
|-------------------|-----------|--------------|--------|-------------------|
| <b>Dipoles</b>    |           |              |        |                   |
| TL2               | BHH + BHG | RRCAT        | 5      | Feb. - March 2008 |
| TL2               | BVA + BVB | Celsius      | 2      | October 2007      |
| TL2'              | BHL       | LURE         | 2      | November 2007     |
| Califes + TBTS    | BHB       | CERN         | 3      | August 2007       |
| <b>Correctors</b> |           |              |        |                   |
| TL2               | D*F       | Ciemat       | 11     | Not foreseen      |
| TL2'              | D*D       | Ansaldo      | 3      | Not foreseen      |
| TBTS              | D*J       | Scanditronix | 10     | February 2008     |

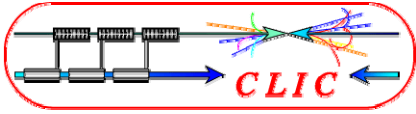


# Magnetic measurements

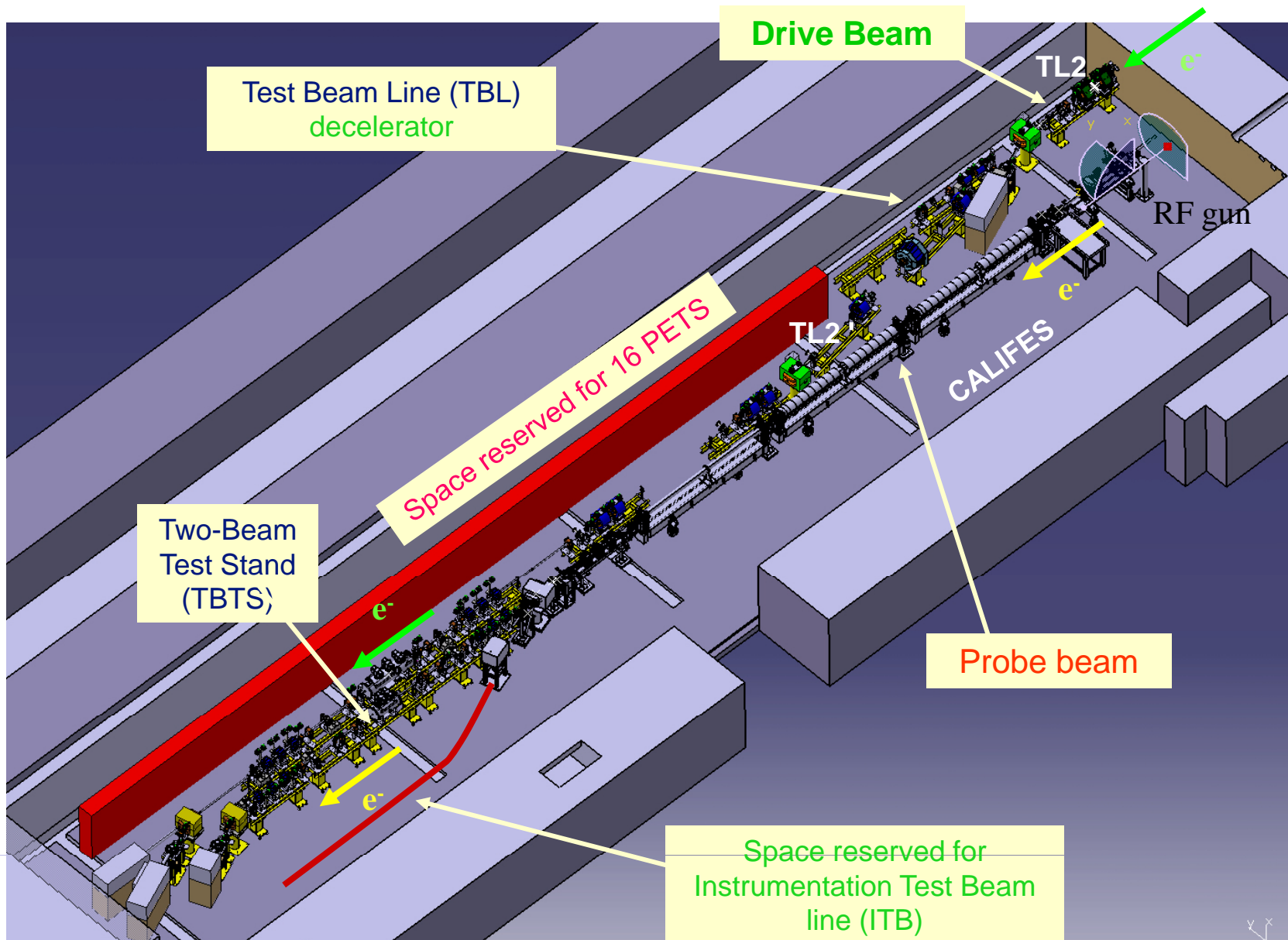


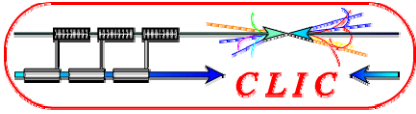
| Place                  | Type name | Origin       | Number | Dates         |
|------------------------|-----------|--------------|--------|---------------|
| <b>Quadrupoles</b>     |           |              |        |               |
| TL2 +Califes +<br>TBTS | Q*D       | Scanditronix | 17     | January 2008  |
| TL2                    | Q*G       | BINP         | 2      | May 2007      |
| TL2                    | Q*H       | CERN         | 7      | March 2008    |
| TL2                    | Q*L       | Celsius      | 16     | January 2008  |
| TL2'                   | Q*N       | LURE         | 2      | January 2008  |
| TL2'                   | Q*P       | LURE         | 2      | January 2008  |
| TL2'                   | Q*Q       | LURE         | 2      | January 2008  |
| TBL                    | Q*M       | LURE         | 2      | February 2008 |



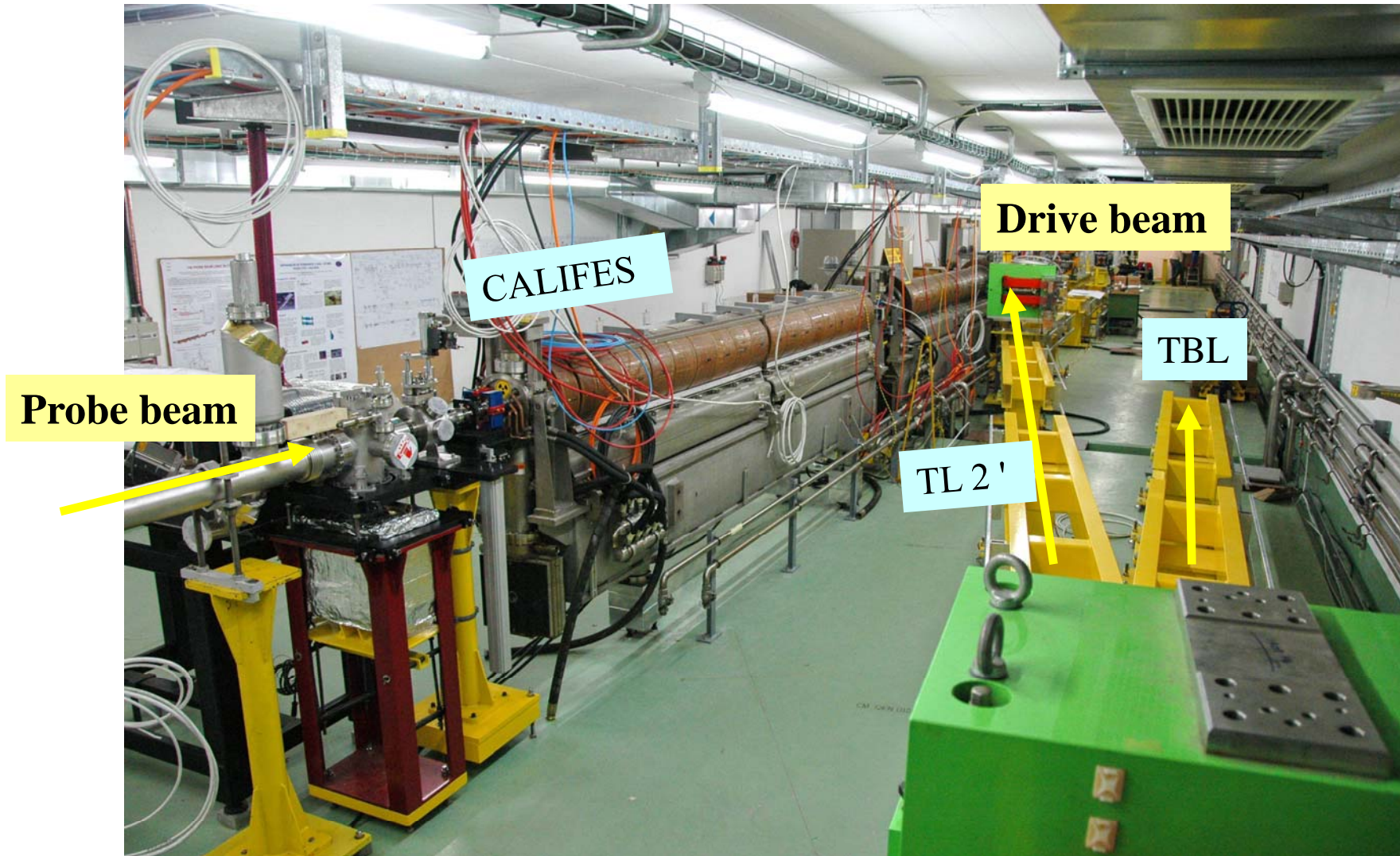


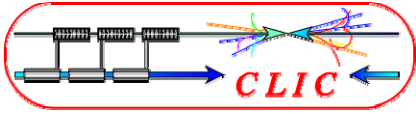
# CLEX Layout



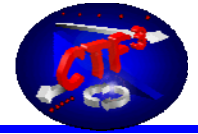


# CLEX





# CALIFES layout



Probe beam

dapnia

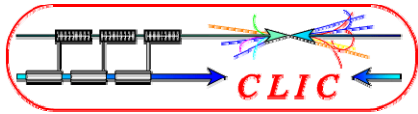


saclay

See *CALIFES Status* talk  
by F. Orsini

by F. Peauger, G. Chemol and R. Roux

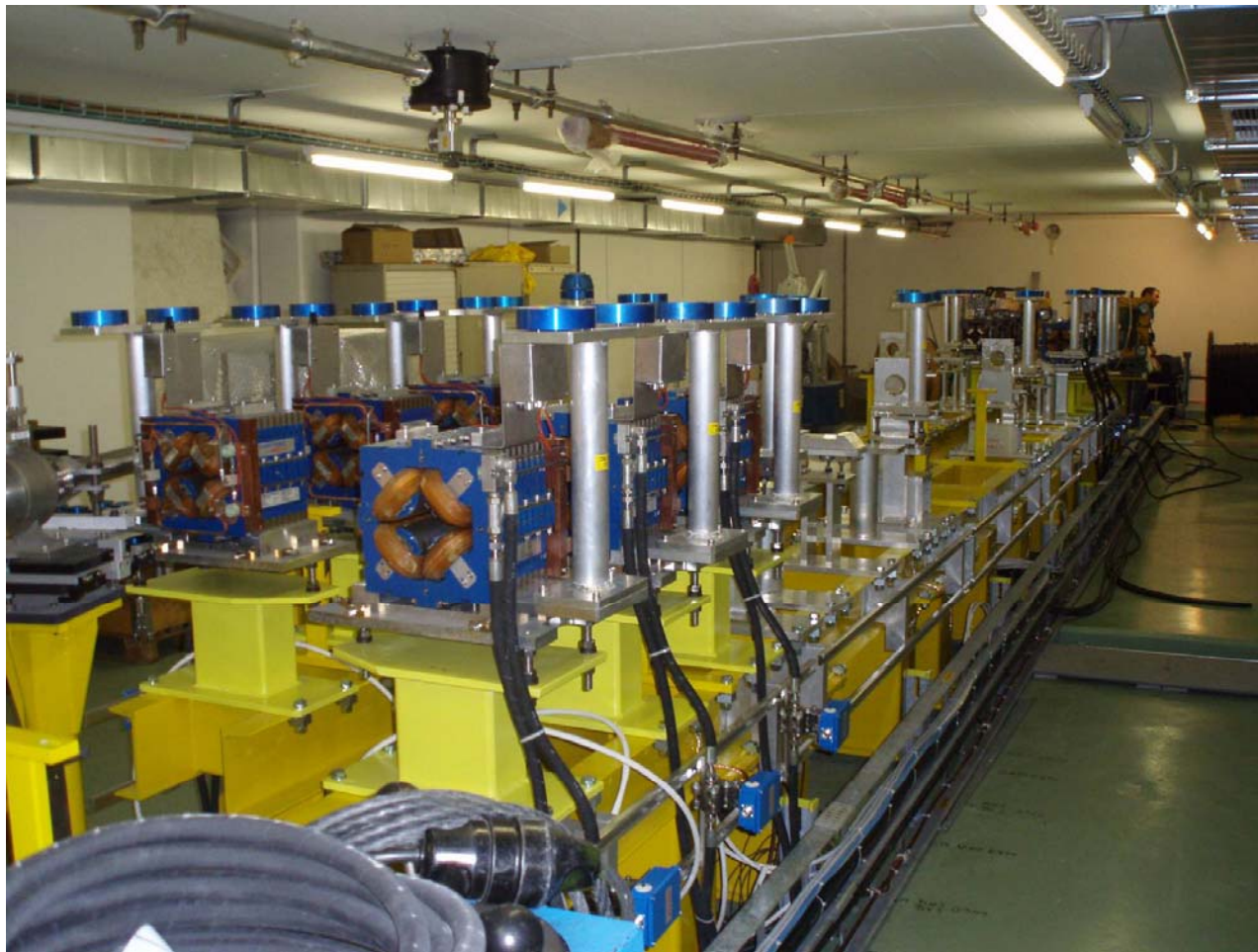




# Two Beam Test Stand (TBTS)

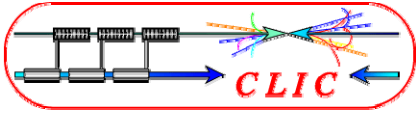


See *TBTS status* talk by R. Ruber, G. Riddone and V. Ziemann

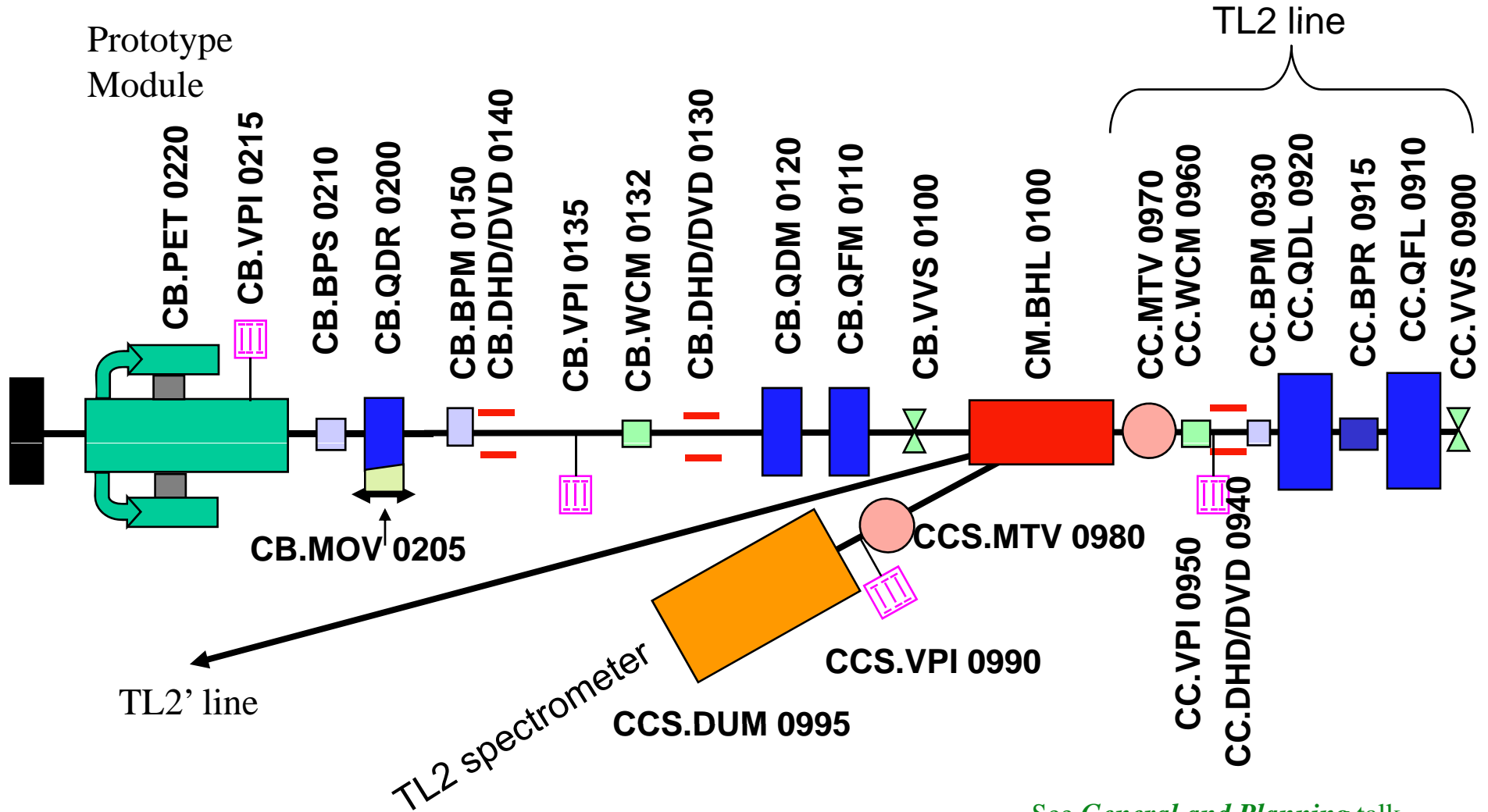
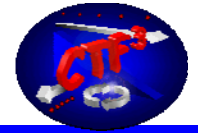


Magnetic measurements done for the Scanditronix Q\*D type quadrupoles

Installation foreseen to be finished for the first stage (only 1 PETS installed) at mid-April

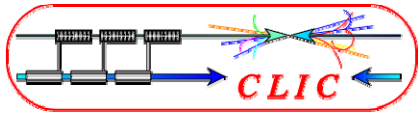


# TBL layout for 2008

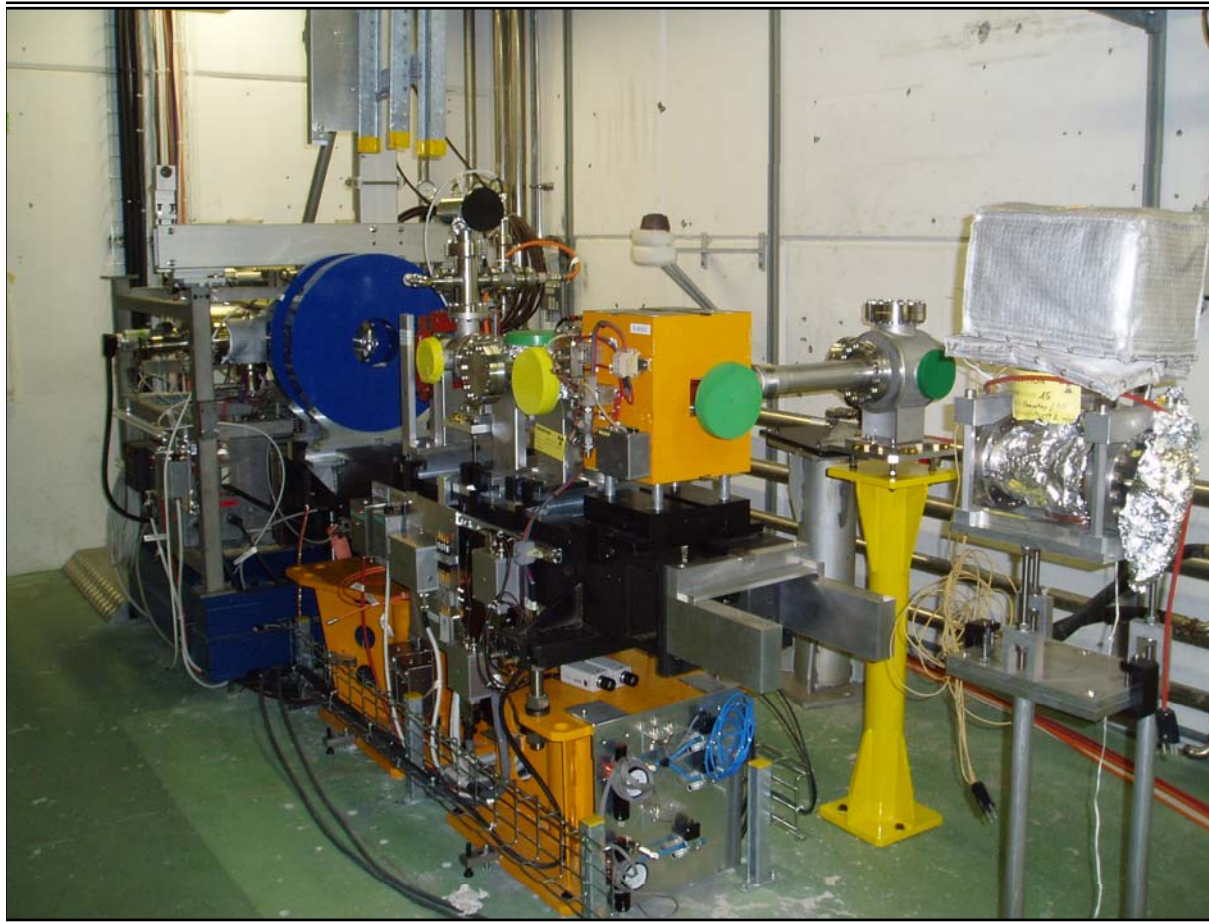


See *General and Planning* talk

by S. Doebert



# Photo-injector into CTF2



Ready for hardware tests

A single klystron MKS 14 shared with reflectors into the Combiner Ring

RF tests performed when TL2 line will be connected to the Combiner Ring

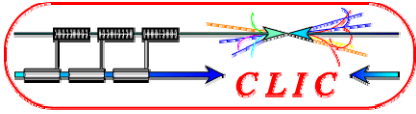
Beam tests done as soon as PHIN gun available and laser beam operational

See *Photoinjector General* talk

by K. Elsener

See *Measurement planned* talk

by S. Doebert

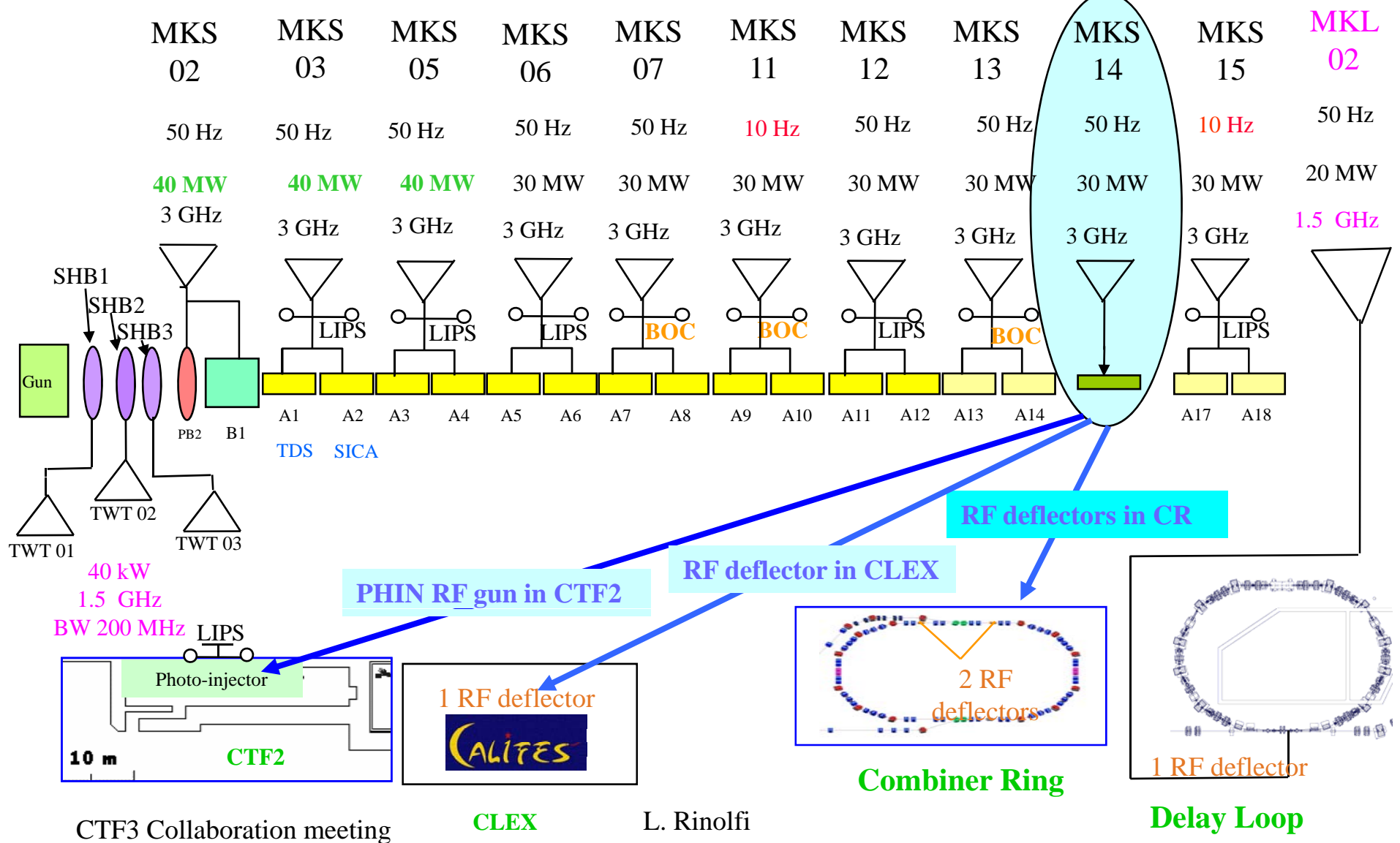


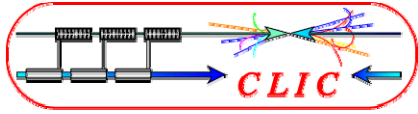
# Klystrons



See *RF System* talk

by G. McMonagle





# Planning



One klystron (MKS 14) used for 3 different users into 3 different zones (Combiner Ring, CLEX, CTF2).

=> Good planning requested for RF conditioning and for Operation

Six "CTF3 teams" have their own constraints and planning for their hardware tests and beam commissioning:

TL2 (Combiner Ring)

CALIFES (CLEX)

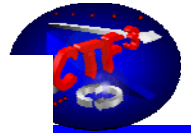
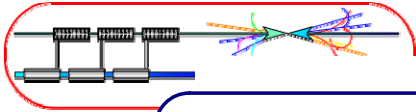
TBTS (CLEX)

TBL (CLEX)

PHIN (CTF2)

12 & 30 GHz (CTF2)





# 2008 - CTF 3 - Schedule

9<sup>th</sup> January 2008

|    | Jan |   |    |                  | Feb  |   |    |    |    | Mar           |               |          |          |  |  |         |  |
|----|-----|---|----|------------------|--|---|----|----|----|---------------|---------------|----------|----------|--|--|---------|--|
| Wk | 1   | 2 | 3  | 4                | 5  | 6 | 7  | 8  | 9  | 10            | 11            | 12       | 13       |  |  |         |  |
| Mo |     | 7 | 14 | CTF3 Coll. meet. | 28   | 4 | 11 | 18 | 25 | 3             | 10            | 17       | Eastr 24 |  |  |         |  |
| Tu | 1   |   |    |                  |  |   |    |    |    | Tests CO + PO | Tests CO + PO | Tests BI |          |  |  |         |  |
| We |     |   |    |                  | <div style="border: 1px solid black; padding: 5px; text-align: center;">           Installation<br/>           TL2 + CALIFES + TBTS + TBL +<br/>           RF photo-injector + 30 GHz (into CTF2)         </div> |   |    |    |    |               |               |          |          |  |  |         |  |
| Th |     |   |    |                  |  |   |    |    |    |               |               |          |          |  |  |         |  |
| Fr |     |   |    |                  |  |   |    |    |    |               |               |          |          |  |  | G. Frid |  |
| Sa |     |   |    |                  |  |   |    |    |    |               |               |          |          |  |  |         |  |
| Su |     |   |    |                  |  |   |    |    |    |               |               |          |          |  |  |         |  |

Water available

Start MKS in diode with CO

Start conditioning MKS for PETS

Start with beam in PETS only

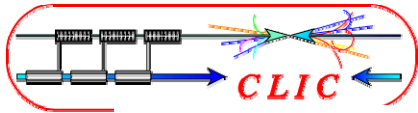
Conditioning MKS for DL & CR

Start with beam in DL and CR

Start beam in CALIFES

|    | Apr       |    |    |    | May  |    |          |    |    | Jun |    |    |    |  |  |  |
|----|-----------|----|----|----|--|----|----------|----|----|-----|----|----|----|--|--|--|
| Wk | 14        | 15 | 16 | 17 | 18   | 19 | 20       | 21 | 22 | 23  | 24 | 25 | 26 |  |  |  |
| Mo | 31        | 7  | 14 | 21 | 28   | 5  | Whit. 12 | 19 | 26 | 2   | 9  | 16 | 23 |  |  |  |
| Tu |           |    |    |    |  |    |          |    |    |     |    |    |    |  |  |  |
| We |           |    |    |    |  |    |          |    |    |     |    |    |    |  |  |  |
| Th |           |    |    |    | Ascen  |    |          |    |    |     |    |    |    |  |  |  |
| Fr |           |    |    |    | <div style="border: 1px solid black; padding: 5px; text-align: center;">           Beam in PETS (nights) and DL &amp; CR (days)         </div> |    |          |    |    |     |    |    |    |  |  |  |
| Sa | Open Days |    |    |    |  |    |          |    |    |     |    |    |    |  |  |  |
| Su |           |    |    |    |  |    |          |    |    |     |    |    |    |  |  |  |

Beam in PETS (nights) and CLEX (days)



|    | Jul |    |    |    |    | Aug |    |    |    |    | Sep |    |    |  |
|----|-----|----|----|----|----|-----|----|----|----|----|-----|----|----|--|
| Wk | 27  | 28 | 29 | 30 | 31 | 32  | 33 | 34 | 35 | 36 | 37  | 38 | 39 |  |
| Mo | 30  | 7  | 14 | 21 | 28 | 4   | 11 | 18 | 25 | 1  | 8   | 15 | 22 |  |
| Tu |     |    |    |    |    |     |    |    |    |    |     |    |    |  |
| We |     |    |    |    |    |     |    |    |    |    |     |    |    |  |
| Th |     |    |    |    |    |     |    |    |    |    |     |    |    |  |
| Fr |     |    |    |    |    |     |    |    |    |    |     |    |    |  |
| Sa |     |    |    |    |    |     |    |    |    |    |     |    |    |  |
| Su |     |    |    |    |    |     |    |    |    |    |     |    |    |  |

Beam in PETS (nights) and DL & CR & CLEX (days)

Jeune G.  
Beam in PETS  
Installation Tail clipper


|    | Oct |    |    |    | Nov |    |    |    | Dec |    |    |    |    |
|----|-----|----|----|----|-----|----|----|----|-----|----|----|----|----|
| Wk | 40  | 41 | 42 | 43 | 44  | 45 | 46 | 47 | 48  | 49 | 50 | 51 | 52 |
| Mo | 29  | 6  | 13 | 20 | 27  | 3  | 10 | 17 | 24  | 1  | 8  | 15 | 22 |
| Tu |     |    |    |    |     |    |    |    |     |    |    |    |    |
| We |     |    |    |    |     |    |    |    |     |    |    |    |    |
| Th |     |    |    |    |     |    |    |    |     |    |    |    |    |
| Fr |     |    |    |    |     |    |    |    |     |    |    |    |    |
| Sa |     |    |    |    |     |    |    |    |     |    |    |    |    |
| Su |     |    |    |    |     |    |    |    |     |    |    |    |    |

CTF3 stop


Beam in PETS (nights) and DL & CR & CLEX (days)


CTF3 SHUTDOWN

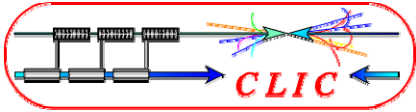
 CTF3 closed with keys for Hardware tests

 CTF3 under access control for HV and RF conditioning

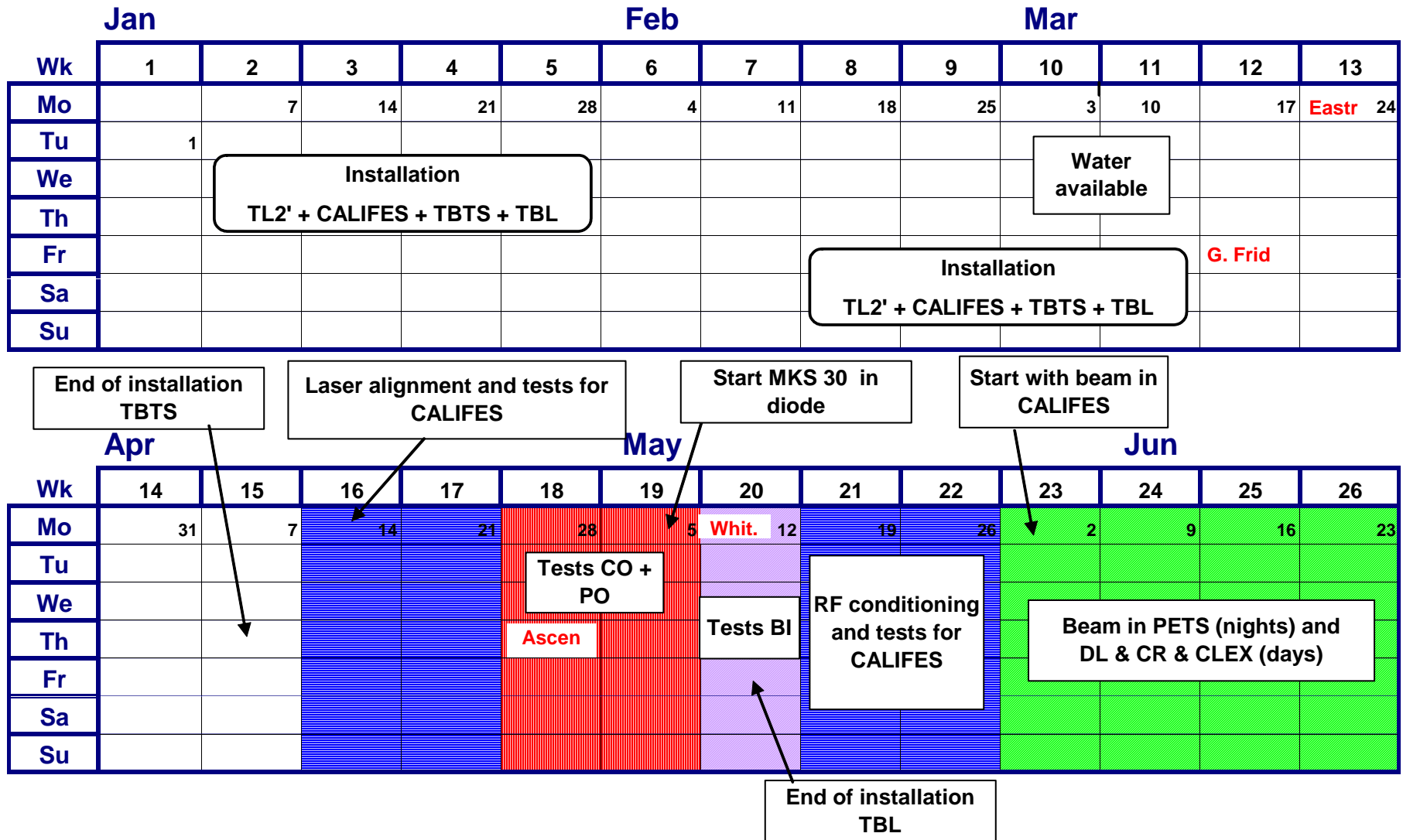
 CTF3 with beam in PETS and CTF2

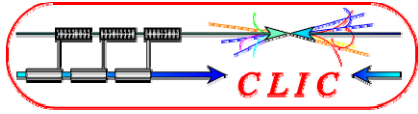
 CTF3 with beam in all area

 Machine open



# CLEX possible schedule





# Conclusion

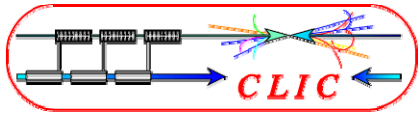


## Next steps in 2008:

- Installation of the transfer line TL2 will be installed for the end of shut-down 2008 and connected to the Combiner Ring as soon as all CLEX installation will be finished (~ end of May).
- Still many constraints to plan hardware tests for the whole CTF3 complex with its 4 independent areas.
- The beam could be started in stages: Linac for PETS (~ 1 April), Delay Loop + Combiner Ring (~ 14 April), then CLEX (~ 2 June ? ), then CTF2 (??) .

## Next steps beyond 2008:

- RF photo-injector PHIN installed for the Drive beam linac
- Upgrades into CLEX (Probe beam, TBTS, TBL,...)



# Thank you to the CTF3 collaborations



dapnia

cea

saclay



Iran

LURE



RRCAT

