

# Technical Developments

## IFIC

### Beam Instrumentation

**CLIC Collaboration Working Meeting,  
2012-16 Work Packages**

**3-4 November 2011**

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**J.J. García Garrigós on behalf of  
IFIC, GAP (Group of Accelerator Physics)**

**<http://gap.ific.uv.es>**

**Valencia, Spain**

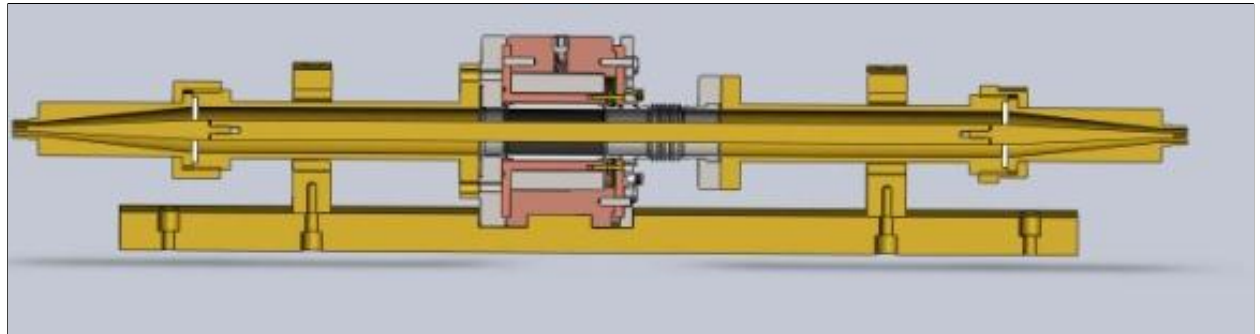
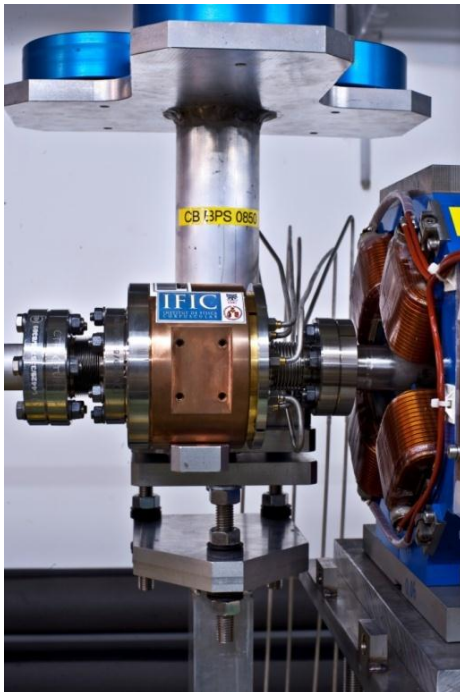
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## ❑ Col. in CTF3 (since 2007):

### Development of Inductive pick-ups (BPS) for the Test Beam Line (TBL).

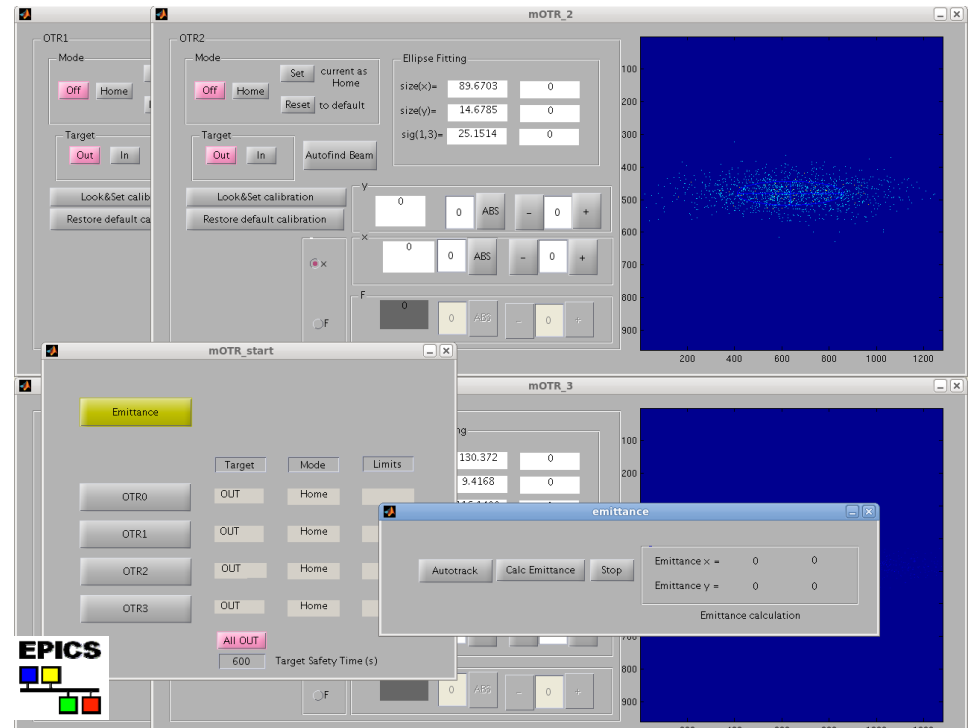
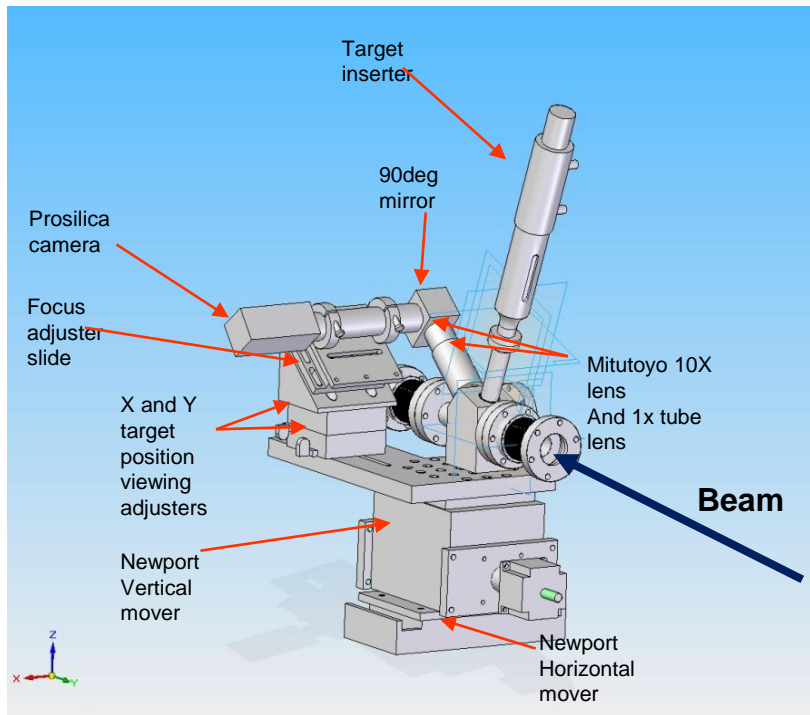
- Design (mechanics, internal PCBs) and construction of 16 (+1 spare) BPS units.
- Installation on TBL completed in Oct. 2009 after BPS series characterization tests at IFIC.
- Development of two dedicated test-benches:
  - Wire test-bench: measurement of BPS linearity and frequency parameters (until 300MHz).
  - HF coaxial test-bench: measurement of BPS longitudinal impedance (until 30GHz).



## ❑ Col. in ATF2 (since 2007):

### Development of Multi-OTR profile monitors for Beam Size & Emittance Measurement.

- Design (mechanics with assembled components) and construction of 4 OTRs located in the Extraction line of ATF2 damping ring (inst. in Oct. 2010).
- Developed jointly with SLAC for fast one-bunch and 5 $\mu$ m resolution beam size & emittance measurements.
- Development of control and beam profile analysis software in Matlab over EPICS layers.



## ❑ Contribution to WP:

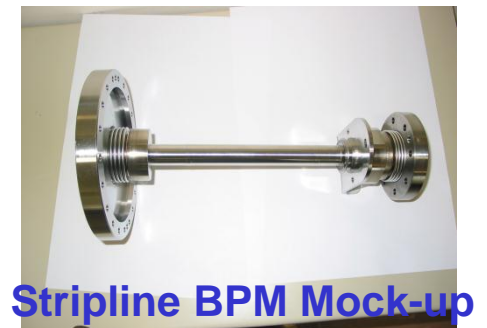
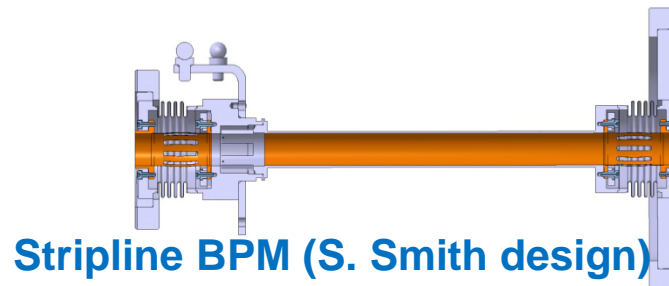
### **Beam Instrumentation [CTC-BDI]**

#### ▪ Collaboration in **Drive Beam BPM [CTC-BDI Task2: BPM Development]**:

An **IFIC member**, A. Benot, is already working (**3 years contract\***) in the BI department under L. Soby supervision in the following activities:

- Evaluation test, and possible design modifications, of the two proposed DB-BPMs, Stripline and Coaxial.
  - Development of the DB-BPM acquisition electronics jointly with LAPP and IFIC.
  - Preliminary Beam Test of DB-BPMs in CTF3.
- We would also be interested in, and IFIC we would have capabilities for:
- **Design and fabrication of read-out electronic (A/D) for beam instrumentation.**
  - **BPMs Test-bench characterization/calibration.**
  - **Software development for beam measurements processing and analysis.**

\* *Col. framework between CERN and the Spanish Ministry of Science and Innovation (MICINN).*



## ❑ Other Related Working Packages:

Given our previous development experience we are also interested in:

- Collaboration in dev. of EM-BPMs (like Drive Beam BPM Stripline/Coaxial).  
WP: ***CLIC 0 Drive-Beam Front End Facility (CLIC0-001)***.
- Continue our dev. support to Inductive Pick-Ups like BPS in TBL .  
WP: ***TBL+, X-Band High Power RF Production & Structure Testing (CTF3-003)***.

# Collaboration Data



Collaborators: general information and resource estimate							
Institute:	Valencia, IFIC (Coll: CERN)						
Main contacts:	Angeles Faus-Golfe						
CERN responsible:	T. Lefevre						
Activity/work package/task:	Beam Instrumentation (CTC-BDI)						
Technical subject:	Drive Beam BPM's						
Working arrangement:	Frequent visits and common workshops; mechanical and electronic workshop available at IFIC						
Funding status:							
Formal agreement:							
Expected resources		2012	2013	2014	2015	2016	Comment
	Material budget [CHF at current rate]						
	Manpower at institute [FTEyears]	1.5	1.5	1.5	1.5		1,5 Engineer
	Manpower at CERN [FTEyears]	1	1				1,0 Engineer

# Experimental Verification

## IFIC

### Contributions to CTF3-003 and CLIC0-001

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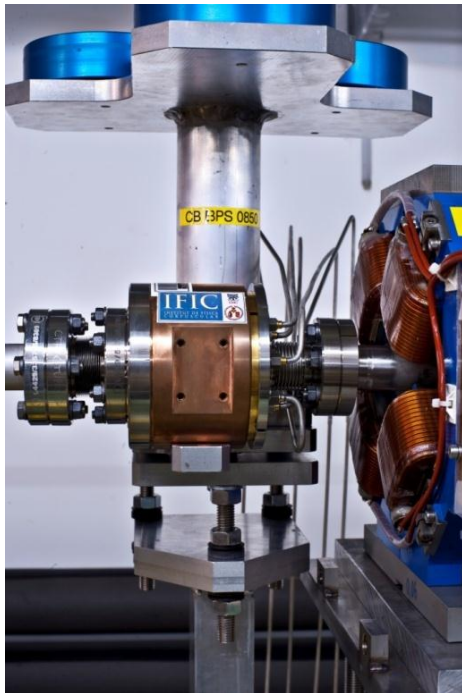




## ❑ Working Package:

### **TBL+, X-band High Power RF Production & Structure Testing, [CTF3-003]**

- Previous contribution in the dev. of 16 BPS units (Inductive Pick-Ups) for CTF3-TBL.
- Within **CTF3-003 Task 3: Operation**, we are willing to continue giving support to BPS and making device performances studies with beam.





# Collaboration Data



Collaborators: general information and resource estimate							
Institute:	Valencia, IFIC (Coll: CERN)						
Main contacts:	Angeles Faus-Golfe						
CERN responsible:	S. Doebert						
Activity/work package/task:	TBL+ (CTF3-003)						
Technical subject:	Inductive BPM performances beam studies with beam						
Working arrangement:	visits to participate in the measurements						
Funding status:							
Formal agreement:							
Expected resources		2012	2013	2014	2015	2016	Comment
	Material budget [CHF at current rate]						
	Manpower at institute [FTEyears]	0.5	0.5	0.5	0.5		0,5 Engineer
	Manpower at CERN [FTEyears]						

## ❑ Working Package:

### **CLIC 0 Drive-Beam Front End Facility (incl. photoinjector option), [CLIC0-001]**

- **Four BPS-dummy units** (w/o electronic PCBs) for mechanical and thermal tests in **CLIC module** (delivered on 2010).

#### **Within CLIC0-001 Task 8: Diagnostics:**

- Collaboration in concept, design and test of **BPM's for CLIC DB injector:**

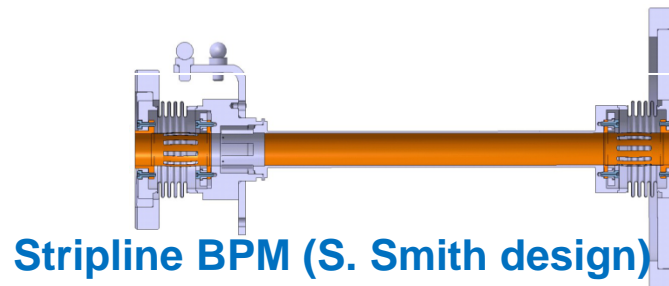
5 Magnetic BPM's sched. 2012-14.

- Collaboration in **Drive Beam BPM [CTC-BDI Task2: BPM Development]:**

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- Evaluation test, and possible design modifications, of the two proposed DB-BPMs, Stripline and Coaxial.
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**Stripline BPM (S. Smith design)**



**Stripline BPM Mock-up**

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