



Multi-OTR Status



A.Faus-Golfe, J.Alabau, C.Blanch,
J.V.Civera, J.J.García Garrigós

IFIC (CSIC-UV)

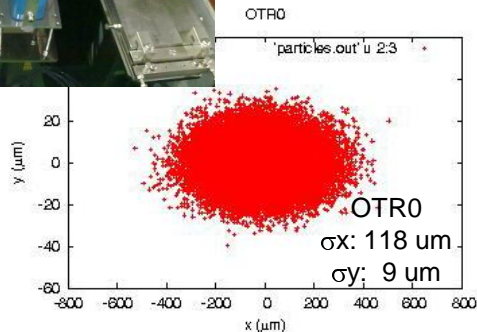
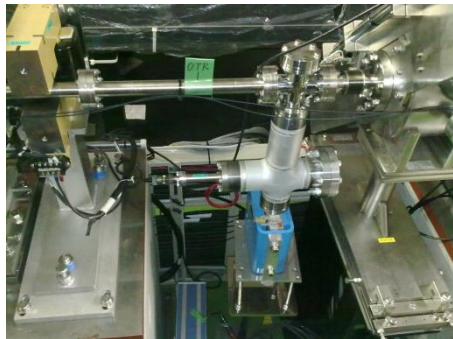
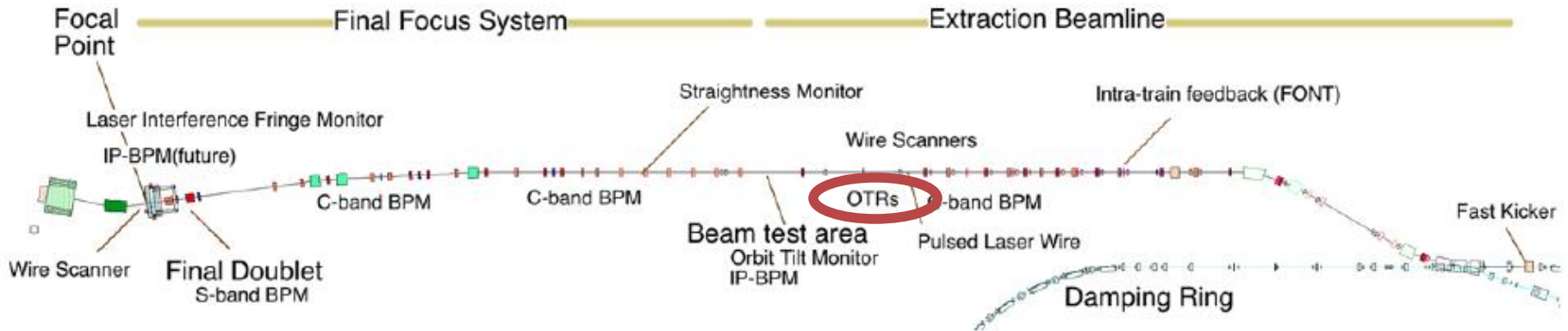
D.McCormick, G.White, J. Cruz

SLAC

and

KEK team

Overview



- **4 OTR monitor** has been installed in the zero-dispersion part of EXT line
- They will take **fast size and emittance measurements** with high statistics
- Design based on existing OTR1X with improved features and **2um resolution**
- They are **installed near WS** for comparison and confirmation of OTR as a beam emittance diagnostic device

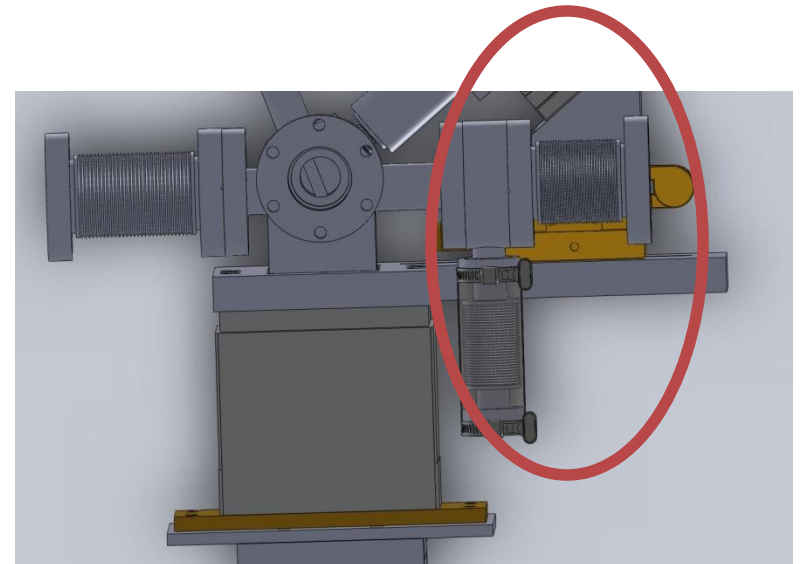
H/W installation



Calibration set-up will be added,
first design

February 2010:

Assembling and first tests at IFIC labs after fabrication



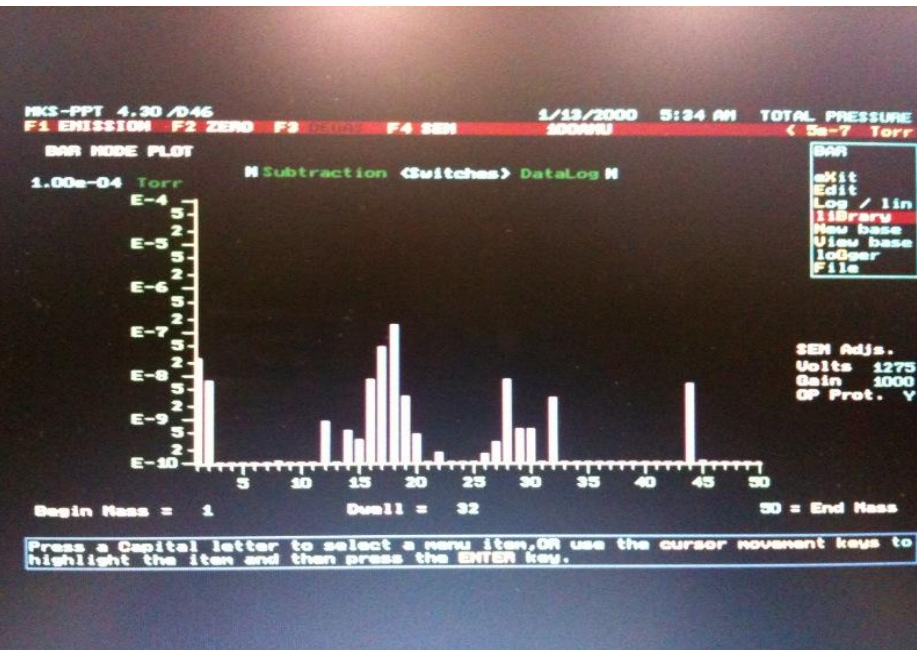
H/W installation

February 2010:
Vacuum test made at
SLAC

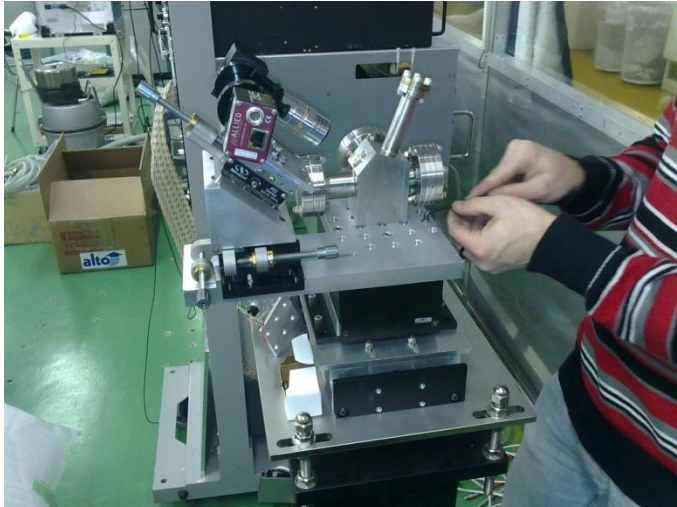


without OTR

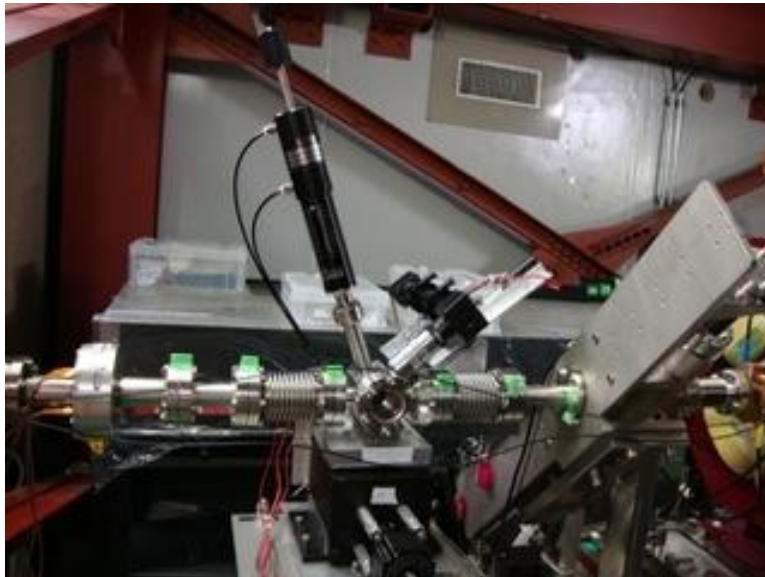
with OTR



H/W installation



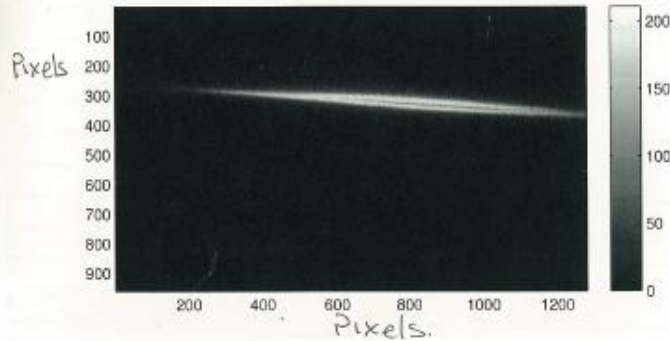
April 2010:
the 4 OTRs were
assembled at
ATF clean room



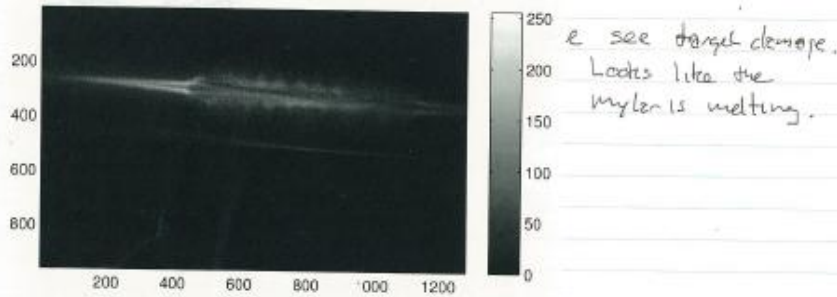
May 2010:
the 4 OTRs
were installed in
the EXT line

OTR Beam Tests - Target Damage Seen

06:30 taking some data with OTR 1



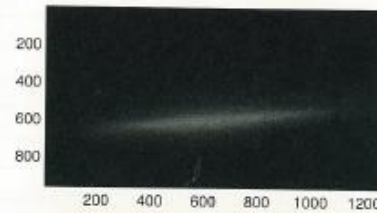
06:45 After observing the OTR spot for several min.



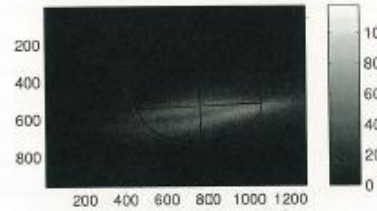
08:05
locking to OTR spot.

Found. OTR spot
 @ H pos 4.97
 V pos 6.70

The pictures of Derian Gray.

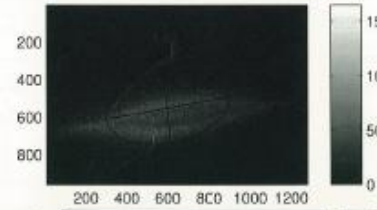


The beam looks good

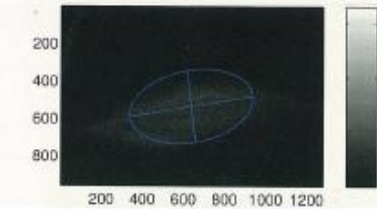


The beam continues to look good

~ 10 min.

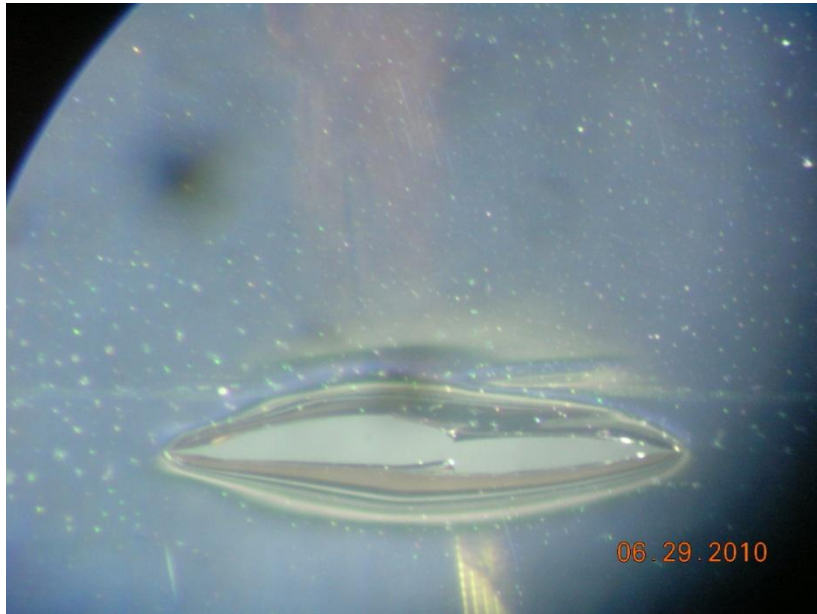


As the picture becomes uglier



and uglier

First calibration tests with beam



June 2010:

- Exercise and **calibration** of vertical and horizontal **movers** and read-back **potentiometers**

-Tests of 4 OTRs during beam time: beam seen but 3 **targets** (nitrocellulose coated aluminum) **were damaged** (4×10^9 e⁻ per pulse)

-Cameras suffer from radiation, some pixel are dead.

Target research

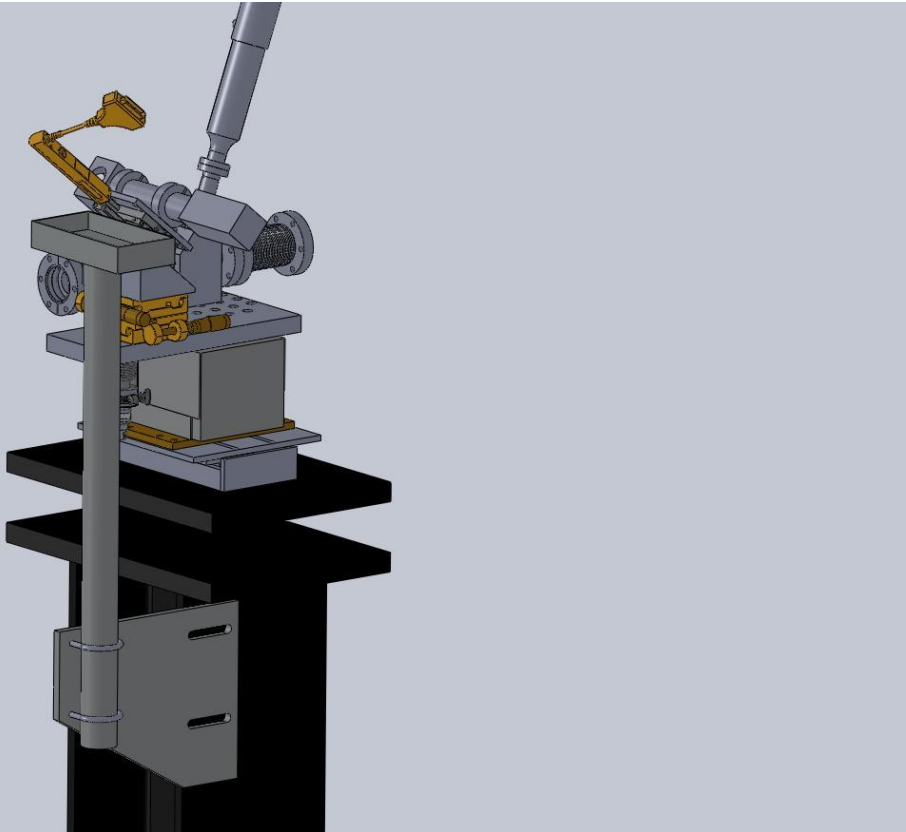
Ongoing:

- Research about most adequate target material is on going. Possible candidates for the fall running are: aluminum coated mylar, aluminum coated kapton or 100um aluminum foils
- In addition to the new types of targets, we are going to modify the existing target holders to hold a vertical and horizontal 10um tungsten wires. By using the vertical and horizontal movers each OTR can be used as a wire scanner. The normal step size in the vertical plane is 2um and 10um in the horizontal. That way we can compare the size measured by the wire and the size measured by the OTR. Both measurements will be in the exact same Z position so calibration will be easy and unquestionable.

H/W developments

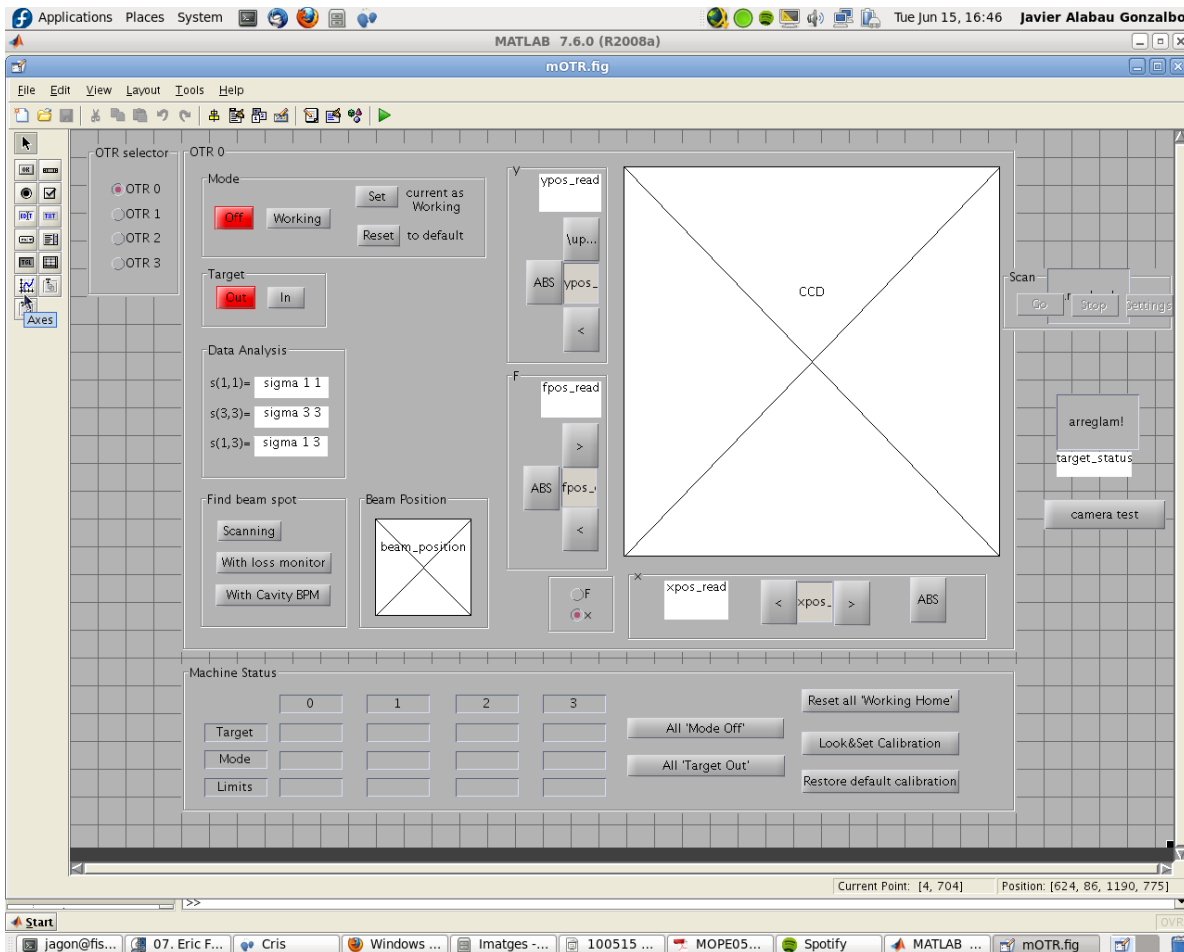
Ongoing:

- Calibration set ups are already finished, they will be installed before the fall running.



- Some shielding is needed in the upstream of the cameras. Design and fabrication of a lead support that would attach to the main OTR stand is on going.

S/W development



On going:

- User interface is being developed in Matlab's GUIDE.
- Connected to multi-OTR via EPICS.
- Will be integrated in the Flight-Simulator.

S/W development

To do:

Single OTR features:

- Stage movement and position readback

- Machine protection

 - Status displays

 - Limit switches

 - Target in/out

 - OTR Working/Off modes

- Setting eventual new calibration or Working mode start point

- Automatic beam finding

 - Scanning an area

 - Using loss monitor to center beam

 - Using neighbour cavity bpm's to track the beam (optics issue)

- Ellipse fitting when beam spot found

Multi OTR features:

- Emittance measurements (assuming beam found in all 4 OTRs)

- Automatic emittance calculation procedure

 - User just press a button and receive the emittance value

Other: OTR1X integration, realistic beam simulations, non-zero dispersion contribution...