

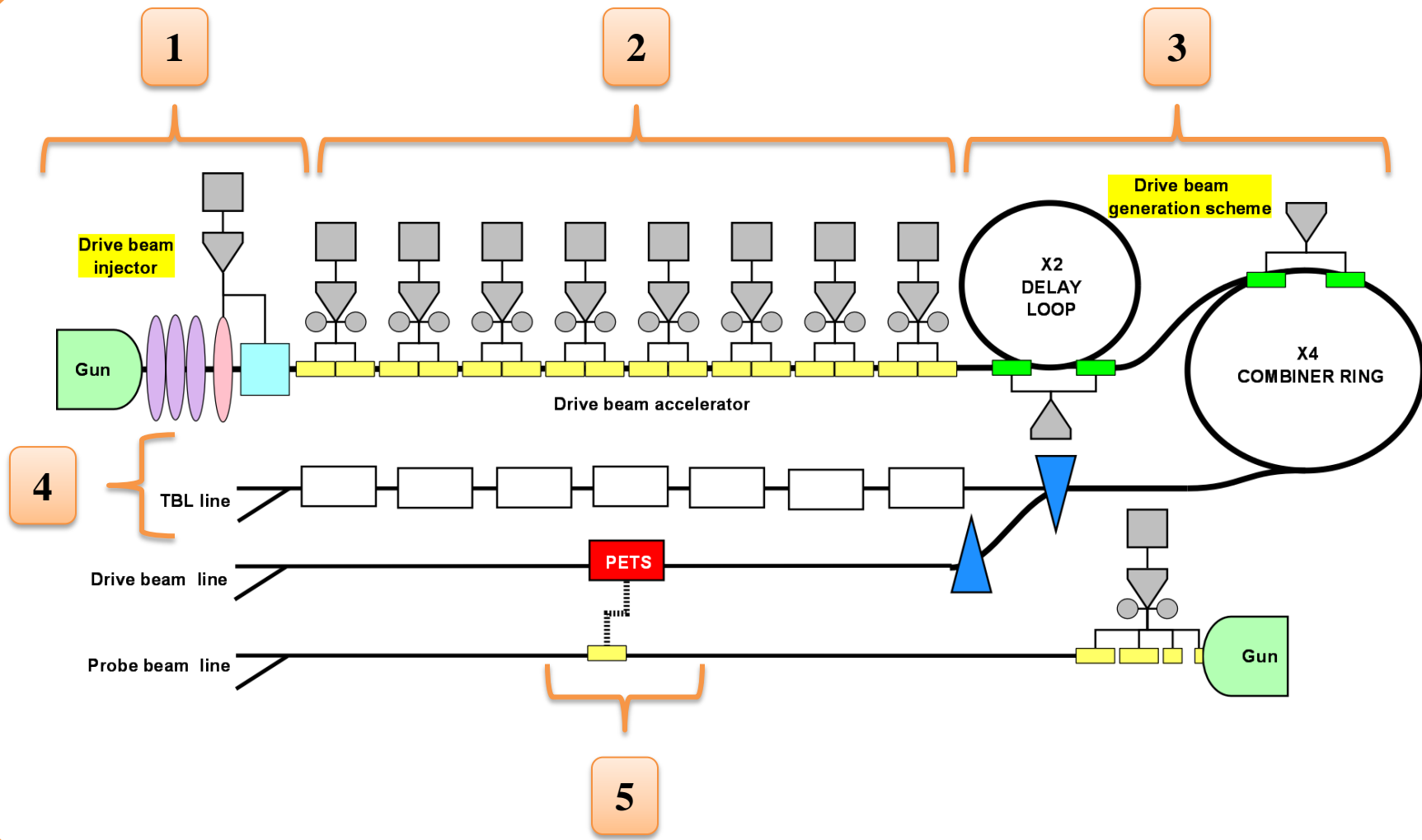
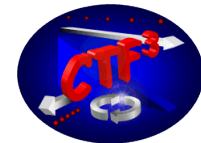
# CTF3 in 2011



*Alexey Dubrovskiy*  
BE/OP, CERN

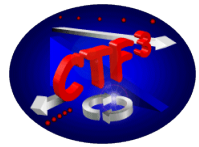


# CTF3 layout

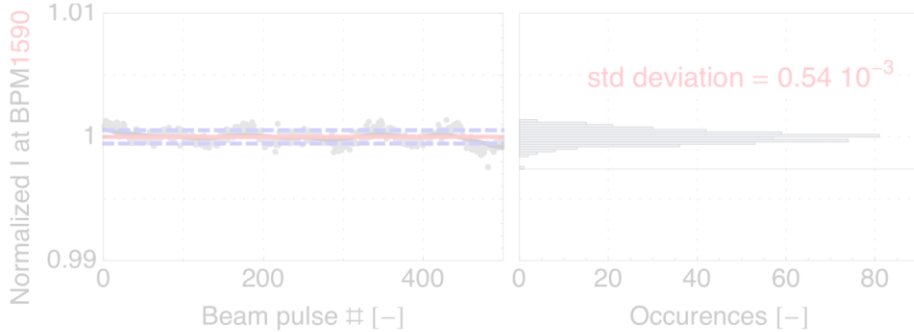




# Injector

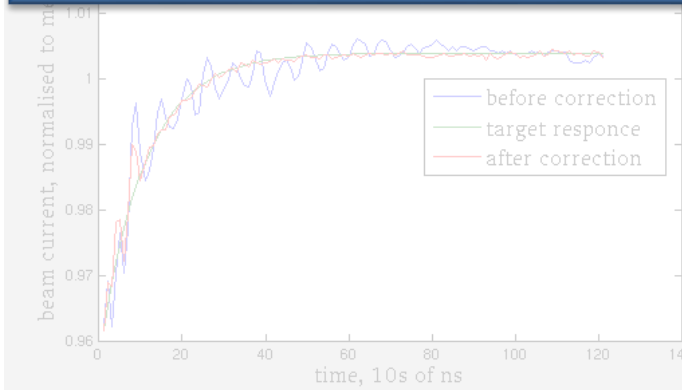


### Current stability



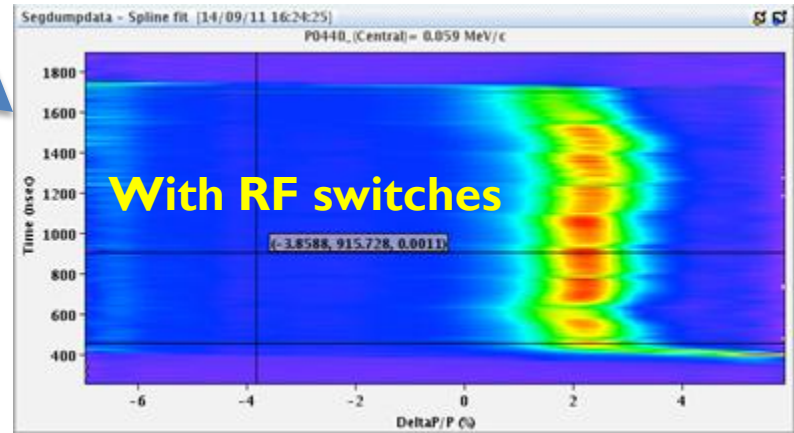
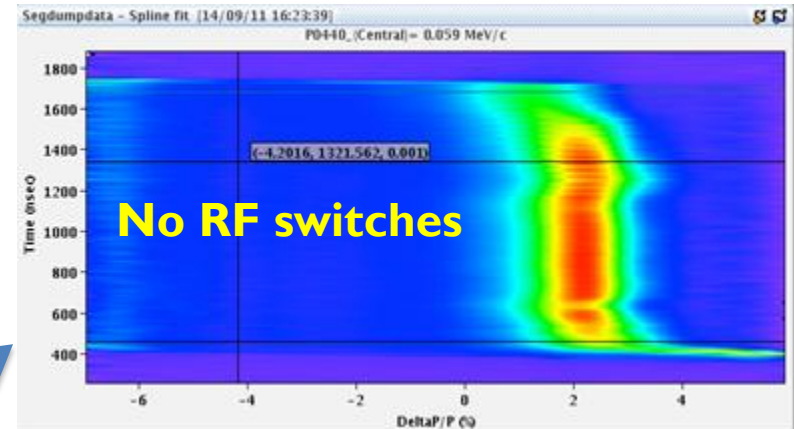
\* G. Sterbini

Application developed by our new technical student **Davide Gamba**



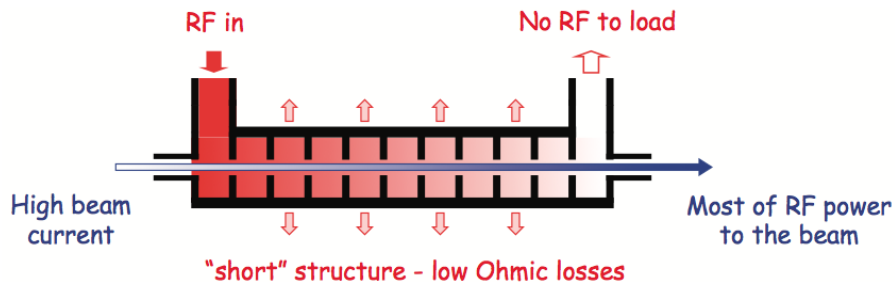
\* A. Andersson

### Beam energy profile



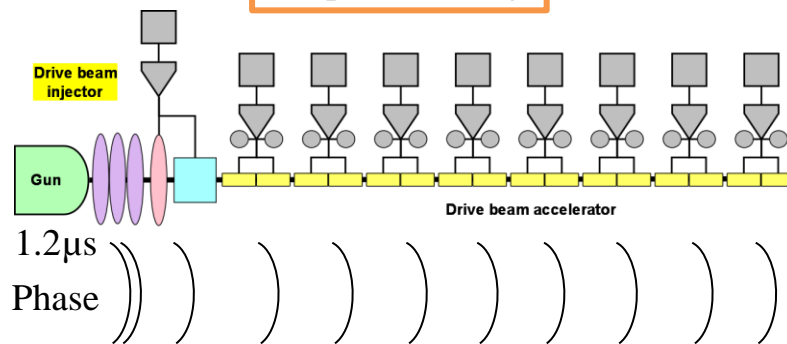
\* F. Tecker, P. Skowronski

## Efficient acceleration



95% RF to beam efficiency measured

## RF phase coding



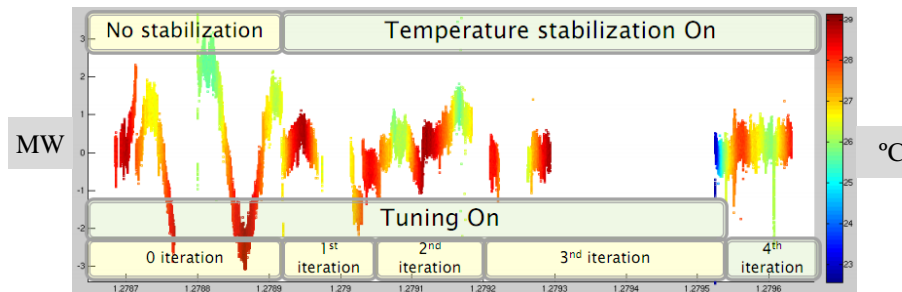
New phase coding subtracted ~2% energy variation along the pulse and it reduced the single bunch energy spread. \* F. Tecker

## Klystron RF stability

	Tolerance	Measured
RF power	0.2%	0.16%-0.21%
RF phase	0.05°	0.035°-0.07°

## Long term RF stability

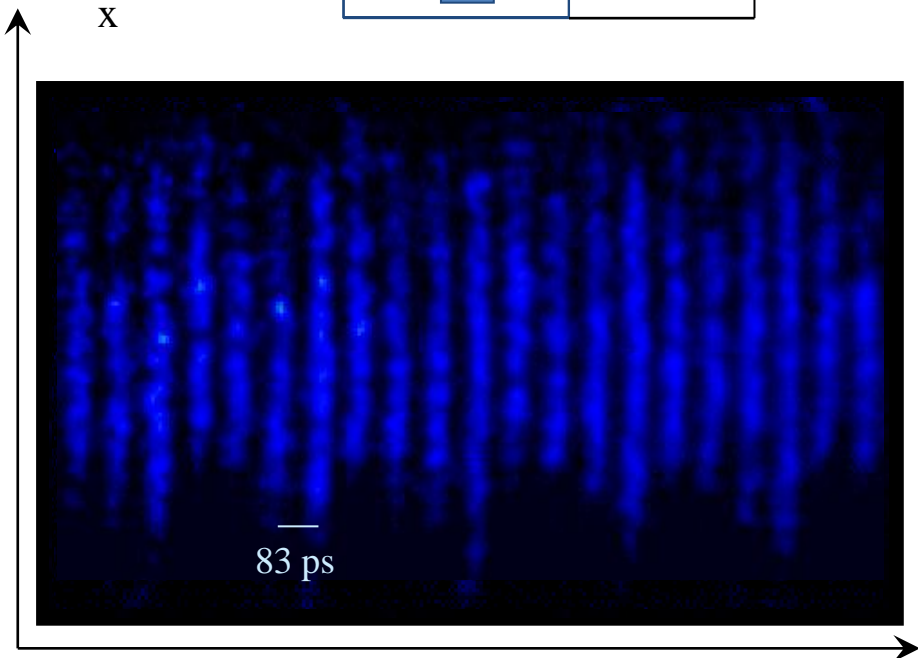
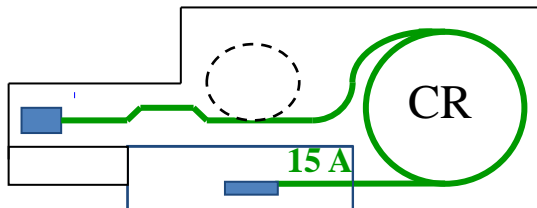
- RF compressors temperature stabilization
- RF phase loops
- RF power flattening
- Reference monitor



## Automation

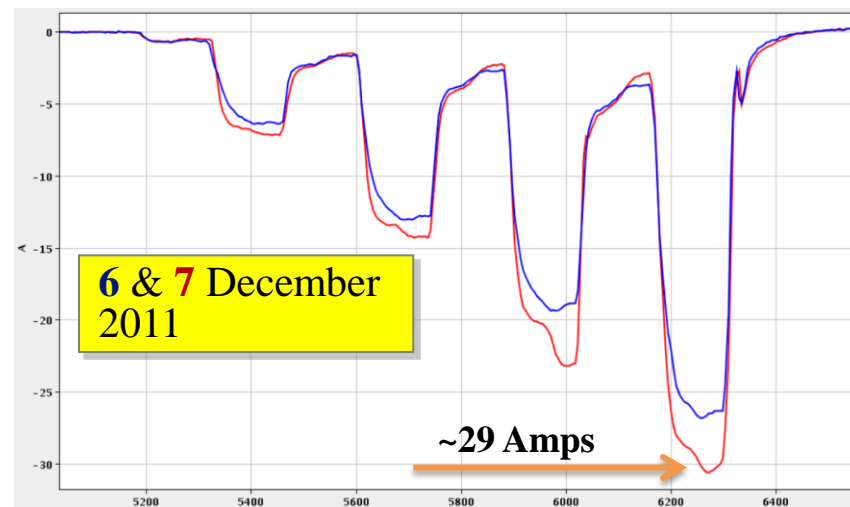
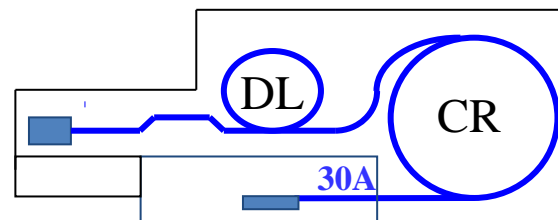
- Automatic klystron reset after a trip
- Automatic beam reset after a trip or an interlock

Combination factor 4



Streak camera image of the beam, illustrating the bunch combination process.

Combination factor 8



A new record of the combination factor 8 was achieved during last weeks of operation in 2011.

## Installation

16 PETS maximum:

- 4 PETS installed and tested
- 5 installed in September
- 12 to 16 next year

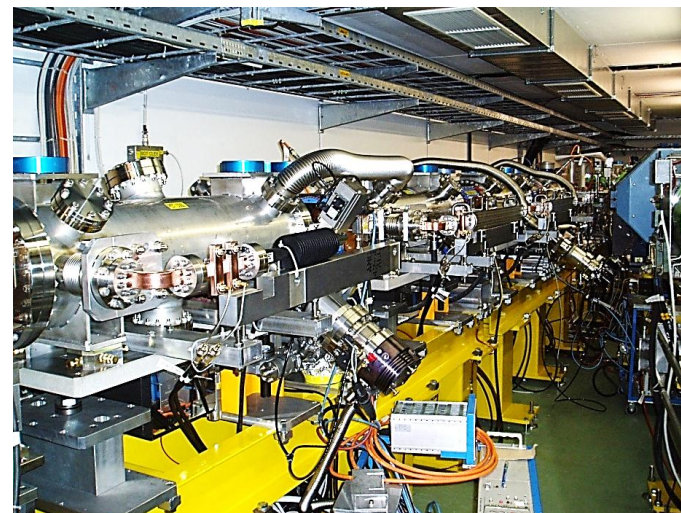
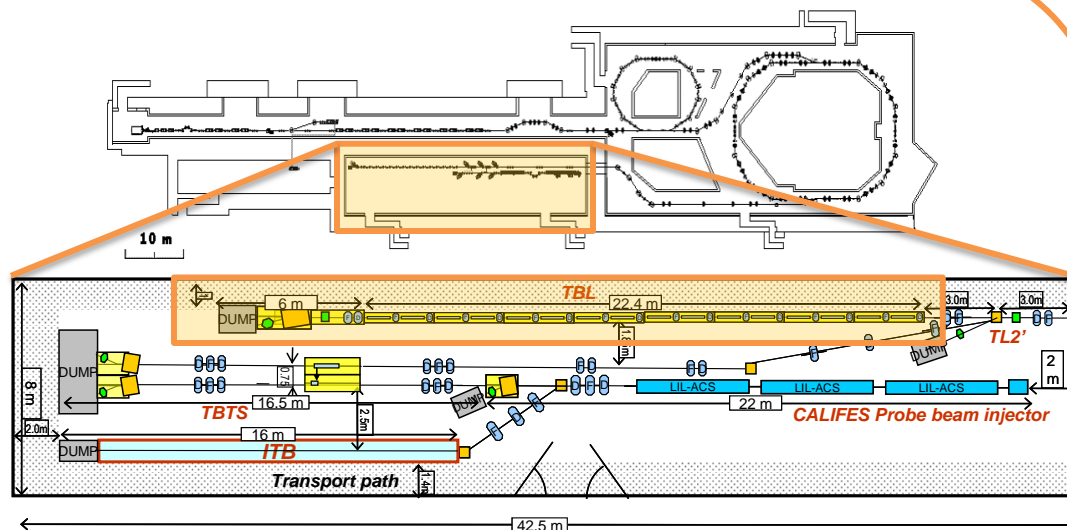
## Achievements

- ~25% deceleration with 9 PETS, 20 A
- Optics studied
- No beam loss
- Good **cross-agreement** between measurements of the power production, the beam current and the beam deceleration

## Tests

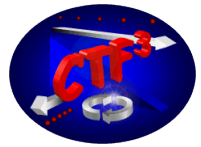
- High energy-spread beam transport
- Decelerate to 50% of beam energy
- Drive beam stability
- Stability of RF power extraction
- Alignment procedures

\* S.Doebert, R. Lillestol

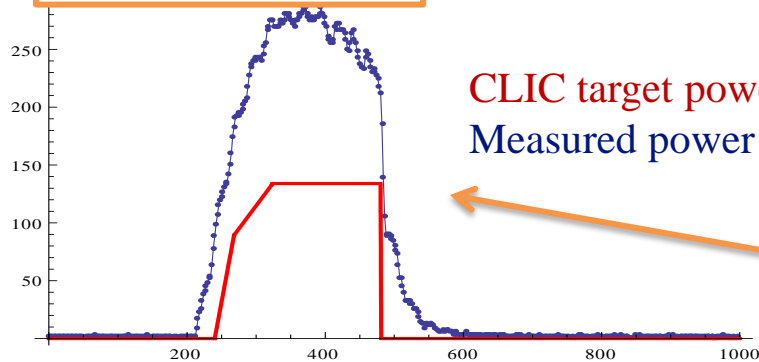




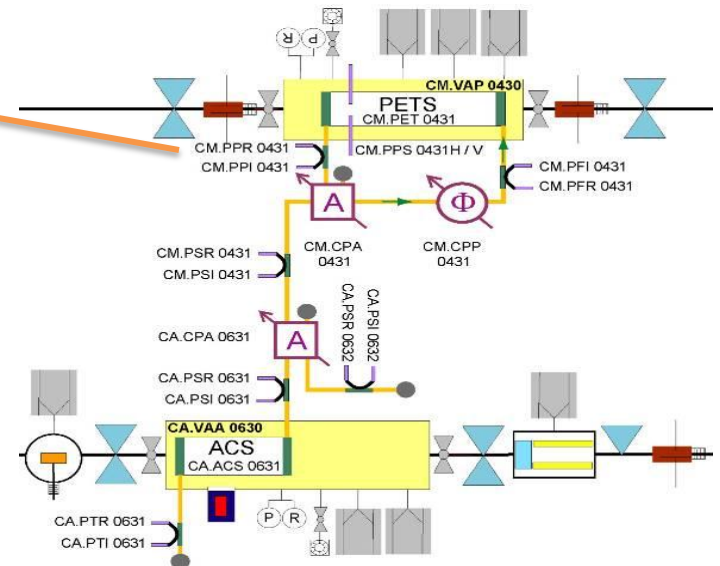
# Two-beam acceleration



PETS, extracted power

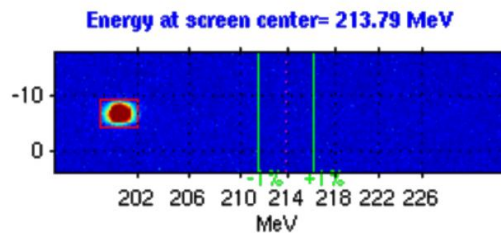
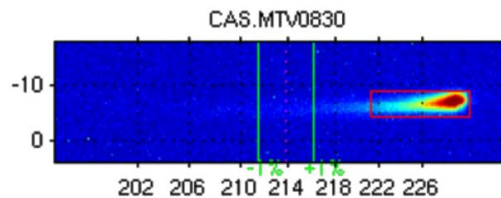


TBTS layout



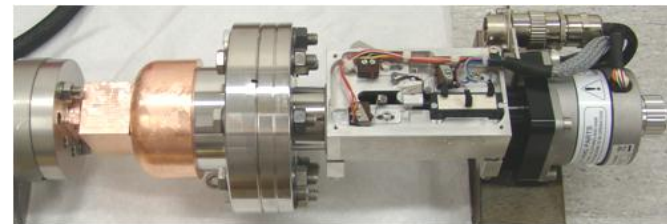
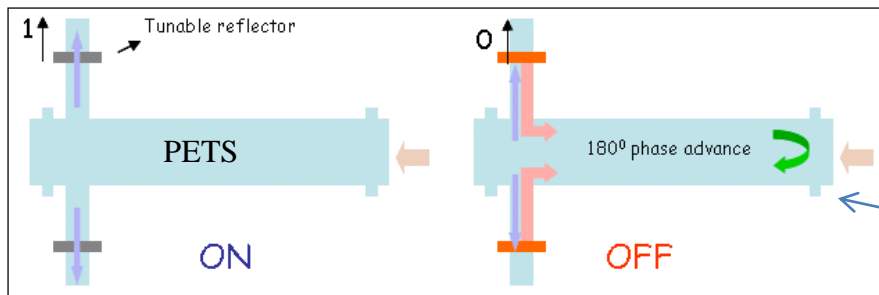
ACS, beam acceleration

15-Jul-2011  
 Energy ACS On = 228.7 MeV  
 Energy ACS Off = 200.6 MeV

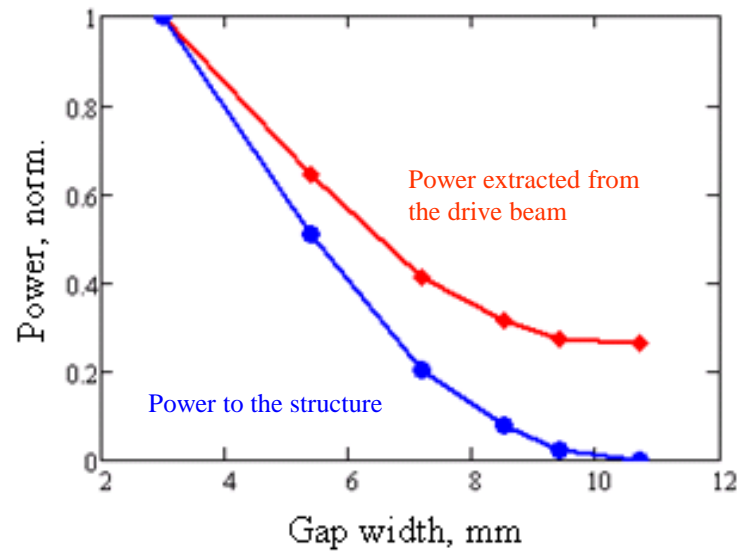
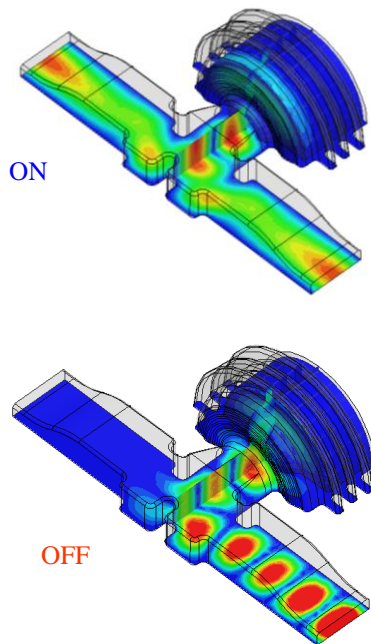


The nominal CLIC gradient is **100 MV/m**  
 The measured gradient is **145 MV/m**

## PETS On-Off principle



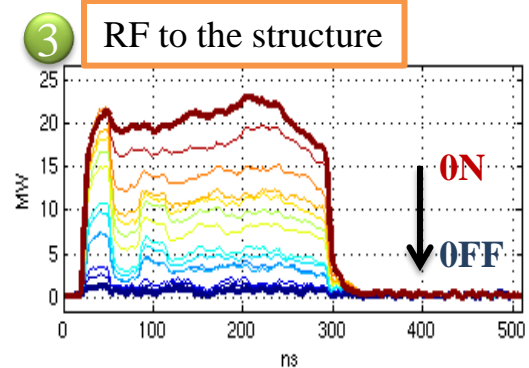
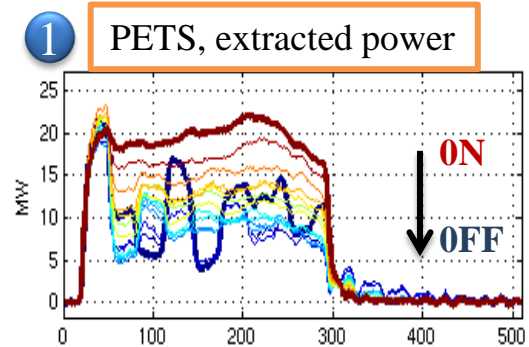
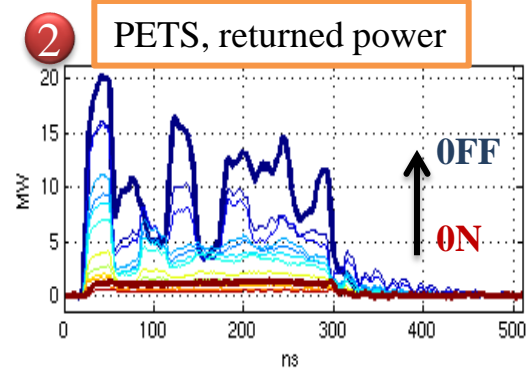
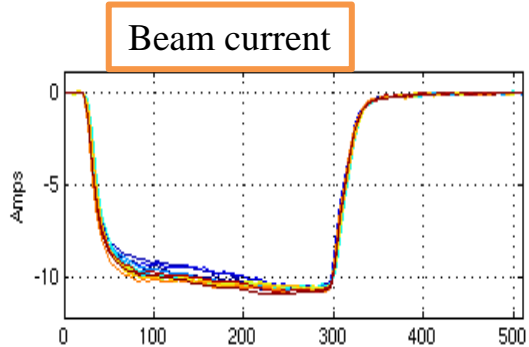
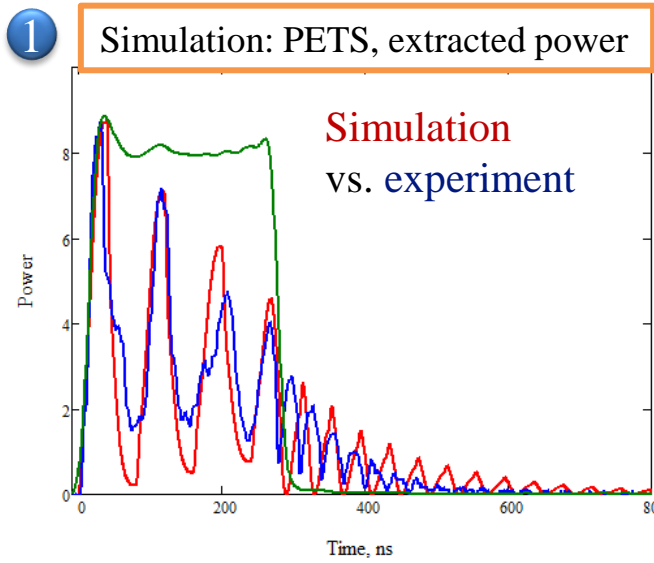
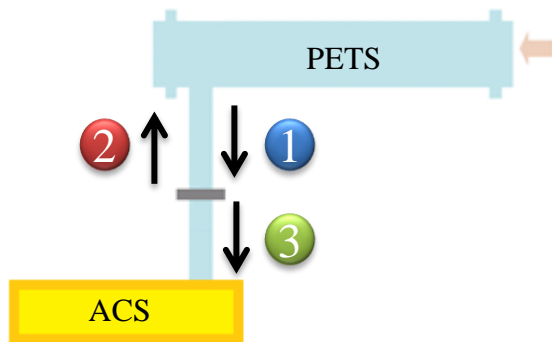
In CTF3 a movable short is added, to allow for recirculation mode



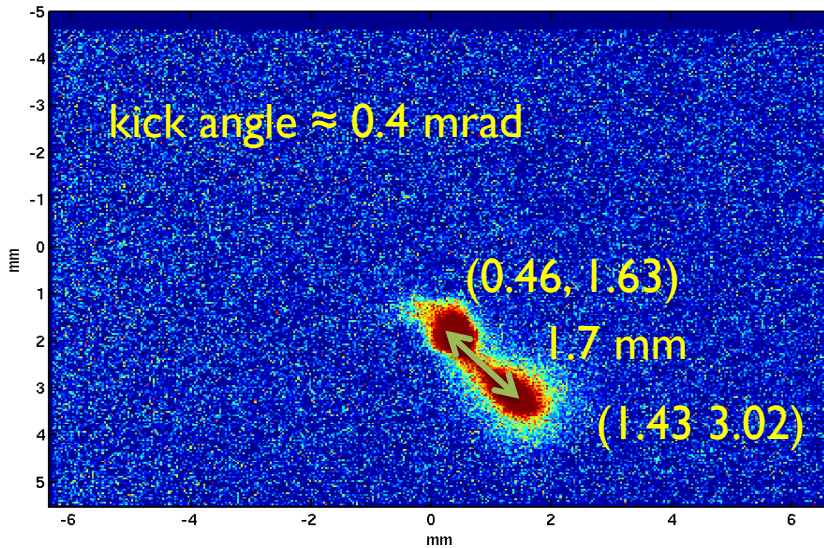
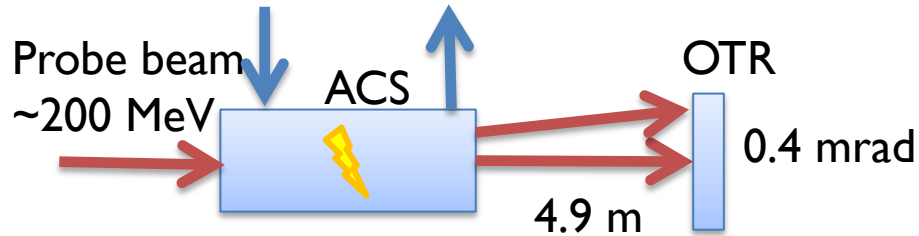
\* I. Syrochev



## PETS On-Off measurements

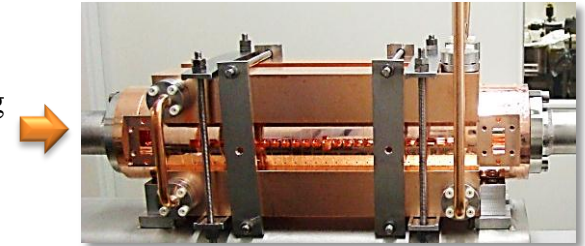


Beam kick measurement on OTR screen

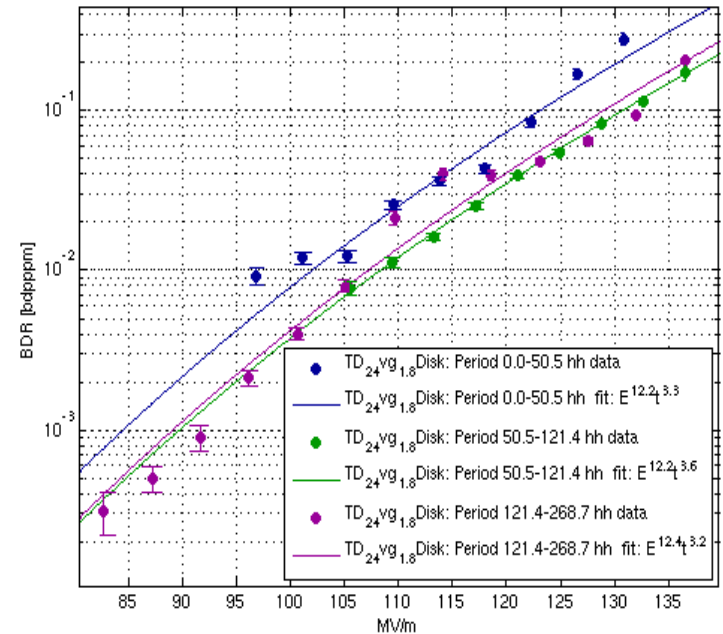


Breakdown rate

TD24 accelerating structure

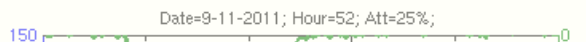
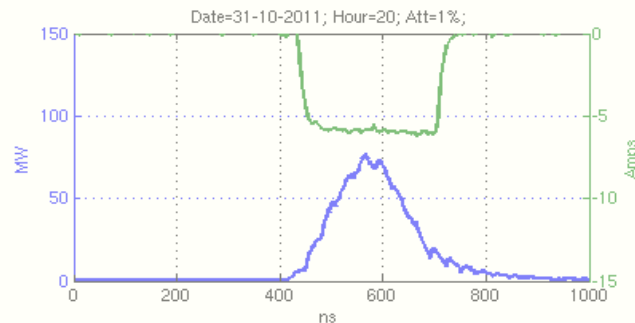
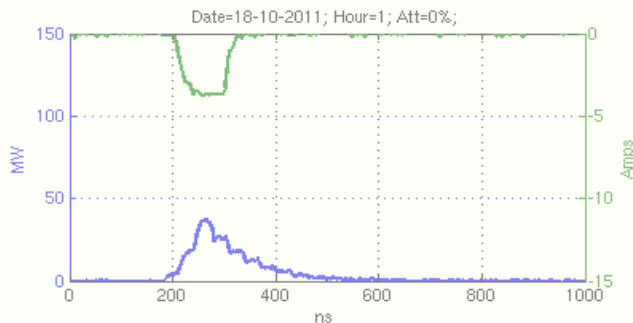
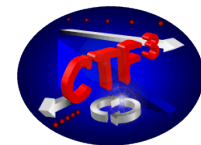


BDR vs Accelerating Gradient at 180 ns

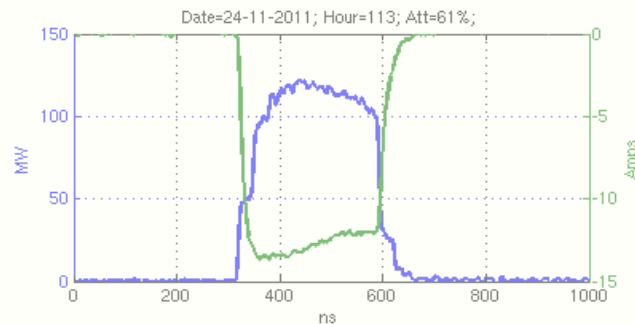
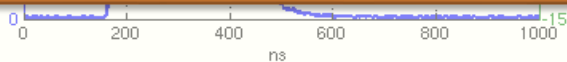




# Round clock operation

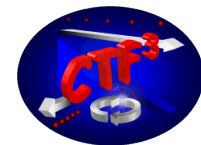


The CTF3 team and CLIC community would like to acknowledge the PS operations team especially for taking care for CTF3 at nights and weekends, as well as for overall help and support.





Thank you for your attention!



Please your questions...