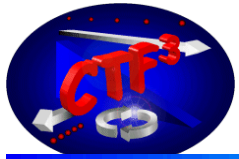


CTF 3 results 2003: measurements I



Frank Tecker – AB/OP
for the CTF3 team

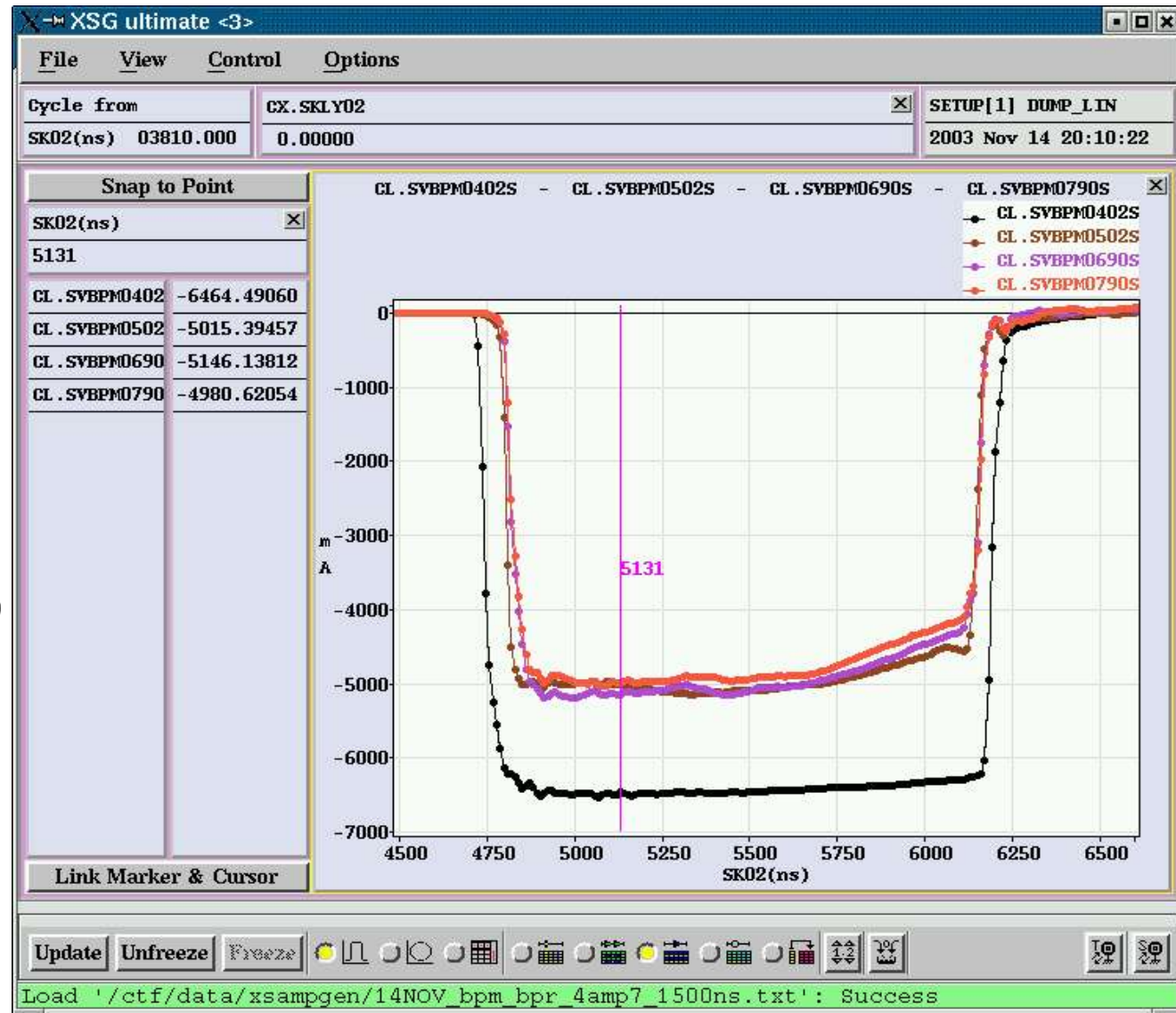
- Samplers: BPMs, RF, SEM
- Segmented Dump
- Beam loss monitor tests
- 18° phase switch in MKS02

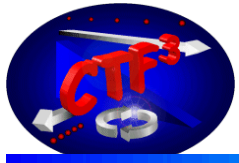


Sampled BPM signals



- standard **ADC**
- **96 MHz sampling**
- averaging in BP
- standard deviation
- 'cursor' selection with averaging
- **calibrated** (not BPR)
 - intensity (in mA)
 - position (in mm)
- time adjusted
- file export/reload



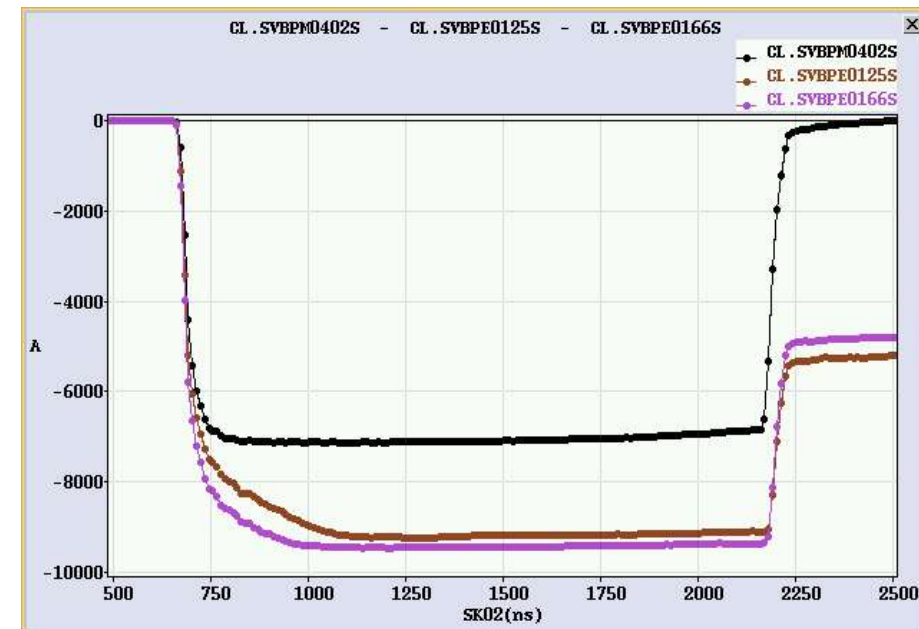
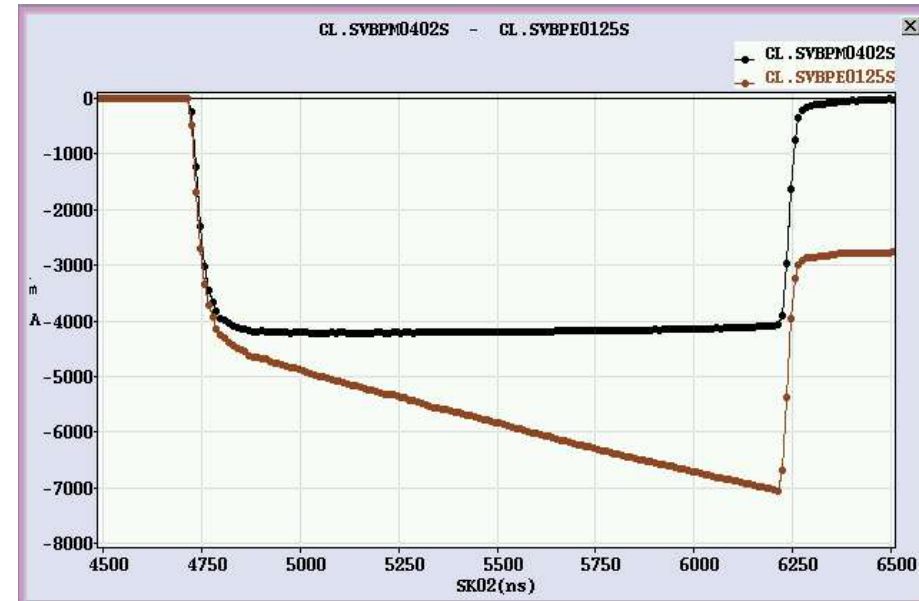


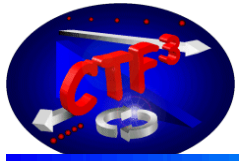
BPX issues



- **BPE charge up** during pulse
- 500 V polarization not enough
- current can be corrected off-line
- saturation around 9 A
=> drift correction impossible

- **BPR** wave guide signal
(bunch length)
=> see Oliver
- diodes broken

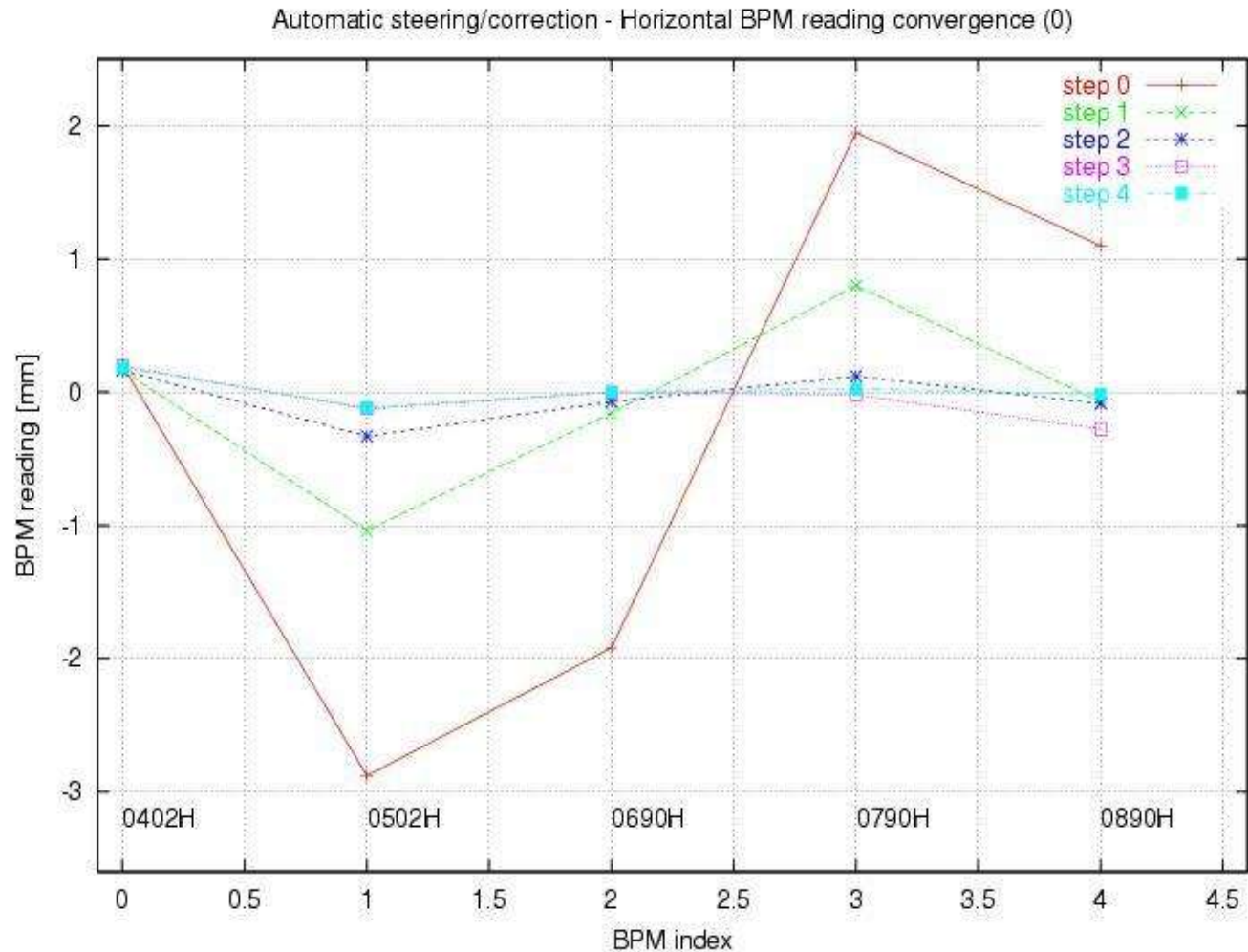




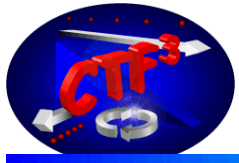
“CLIC steering”



- automated **response matrix measurement** by changing correctors
- used to calculate trajectory correction
- fast **convergence**
- comparison to machine model in progress



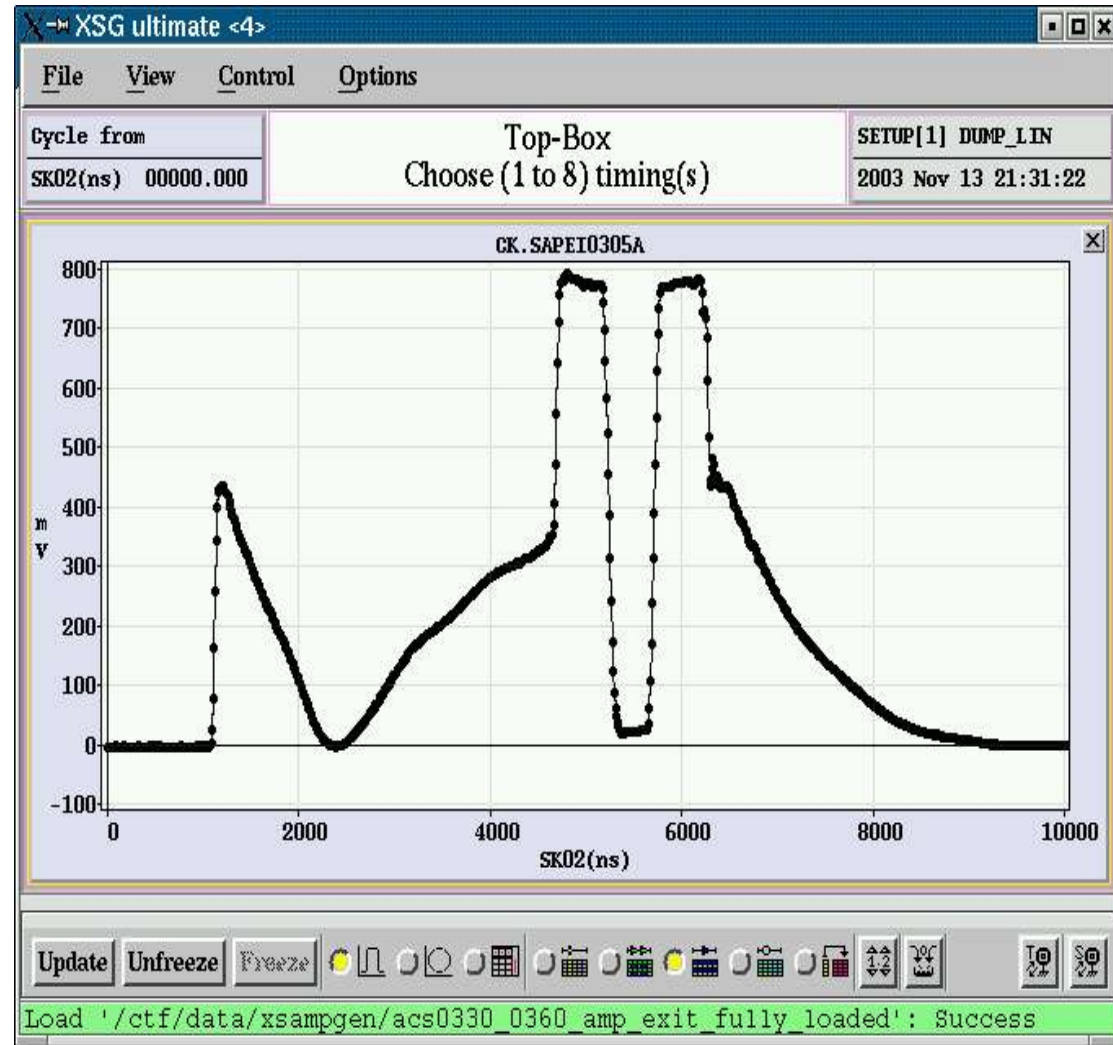
R.Lifshitz

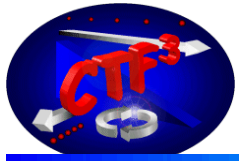


RF signals

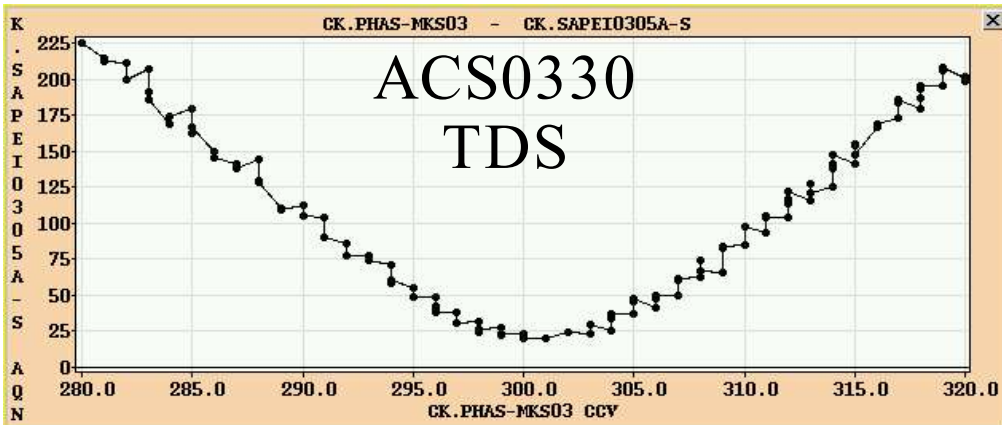


- standard ADC as for BPM
- identical software
- calibration for power and phase
 - only at the end due to changing calibration and lack of amplifiers

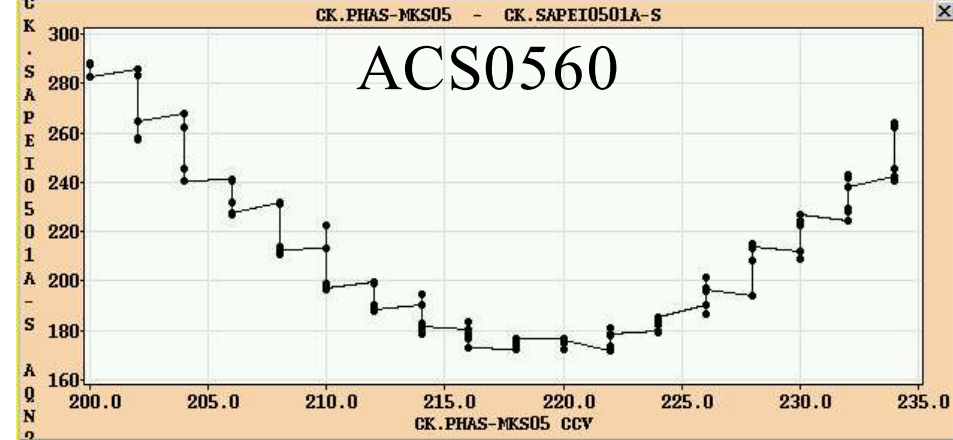
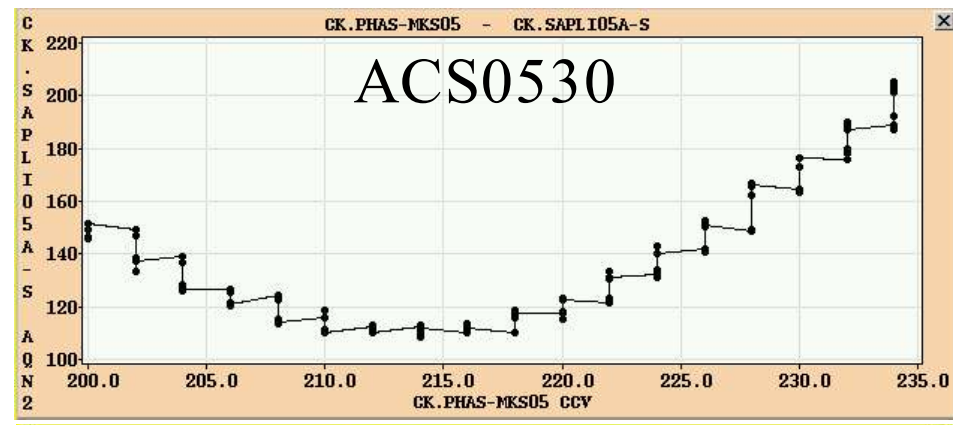




RF phase of the structures

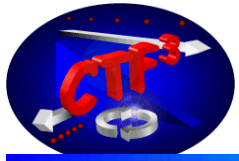


RF field at exit -->



phase -->

- recording height of **beam-loading** vs. **phase**
- ACS0330/0360: $\sim 1^\circ$ phase difference
- ACS0530/0560: $\sim 4^\circ$ phase difference

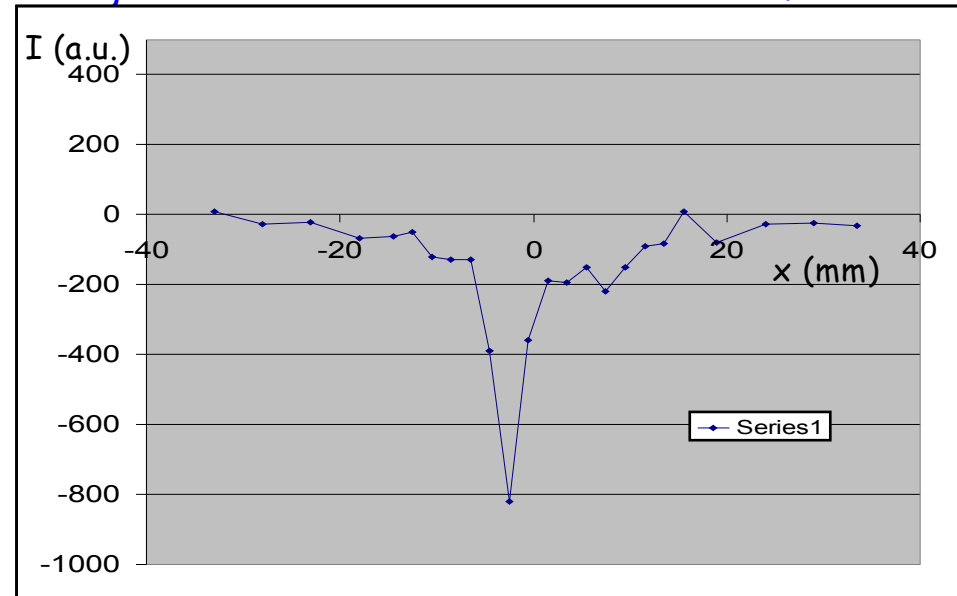


SEM Grid

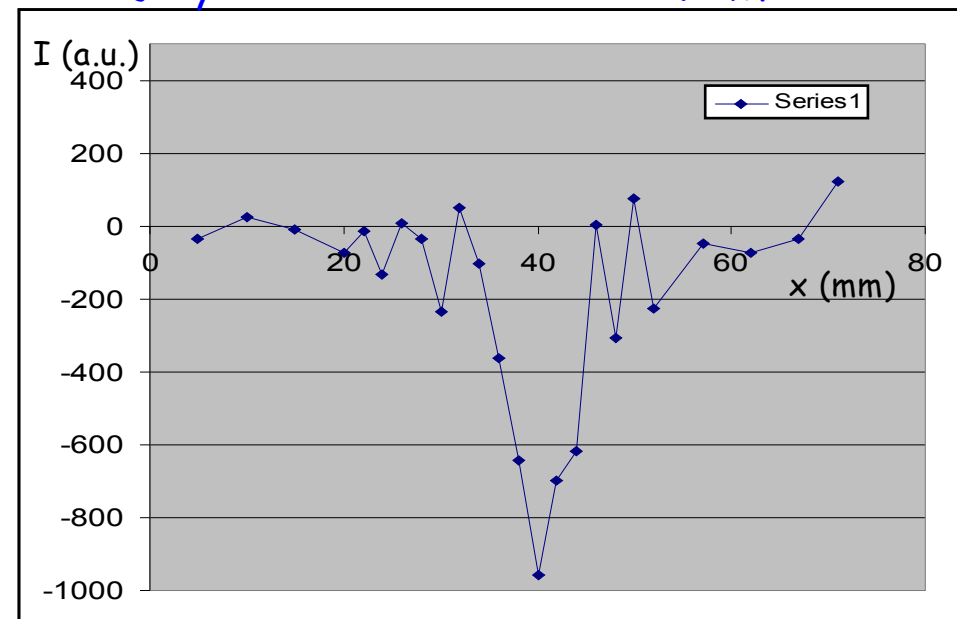


- profile only at low current
- at high current:
 - parasitic signals
 - pos./neg. signals, strange shape
 - saturation
- various electronics tested
- => no clear conclusion

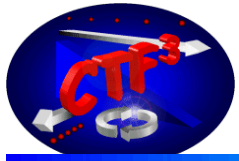
August 13th 0.7 A - 300 ns - 21.5 MeV



July 31st 1 A - 320 ns - 25.5 MeV



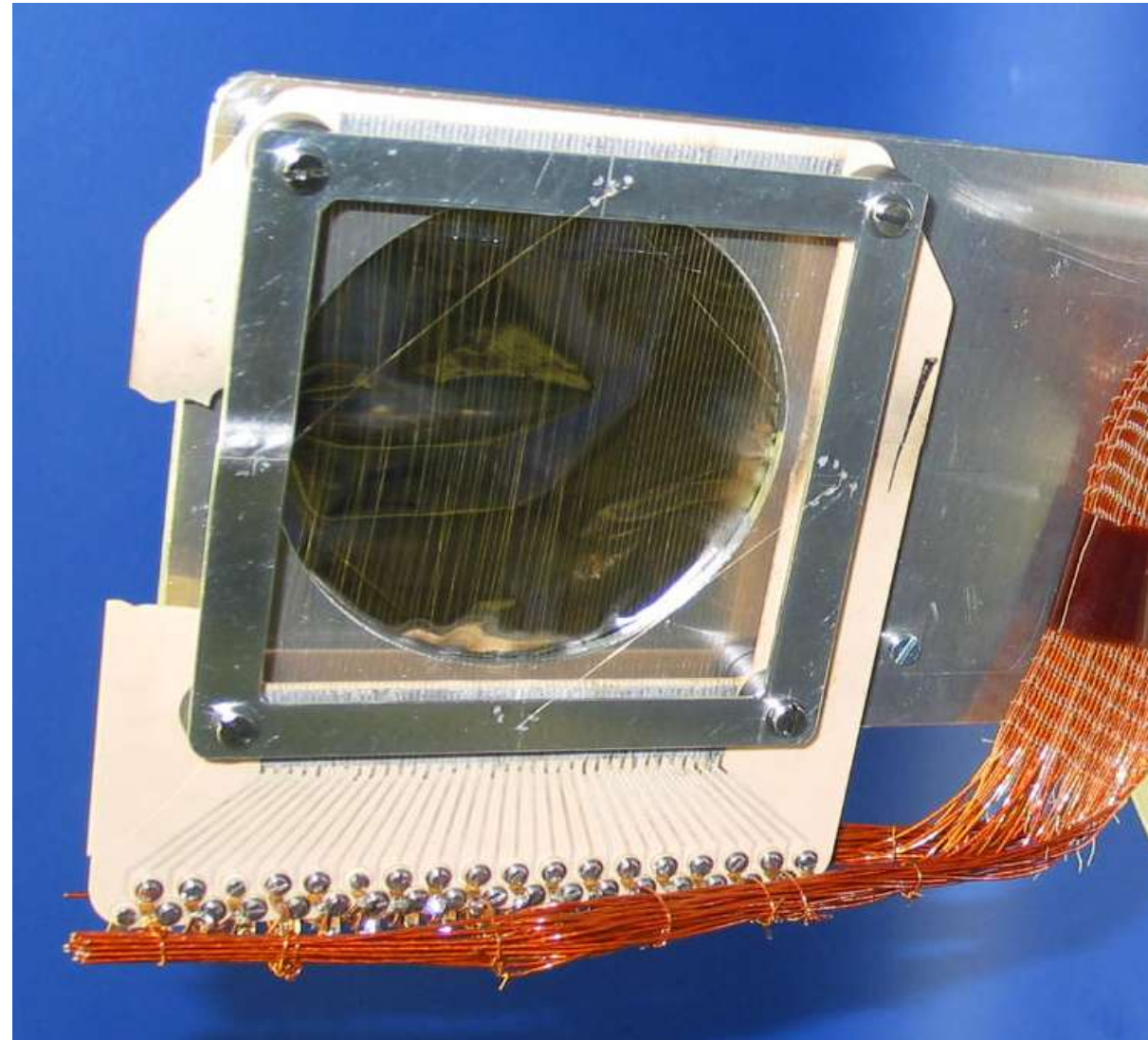
R.Corsini



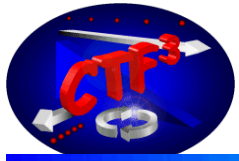
SEM Grid (2)



- MSH0435:
 - ceramics broken
 - wires loose but not broken
 - blue spot on frame
- MSH0745:
 - no visible damage
- for 2004:
 - construct 'test SEMgrid'
 - shield frame



C.Dutriat

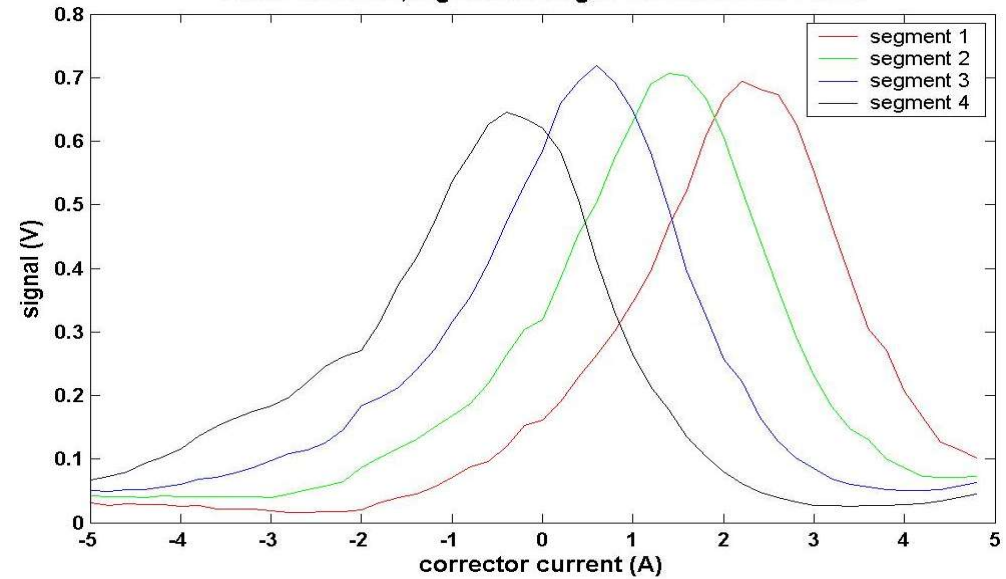


Segmented Dump

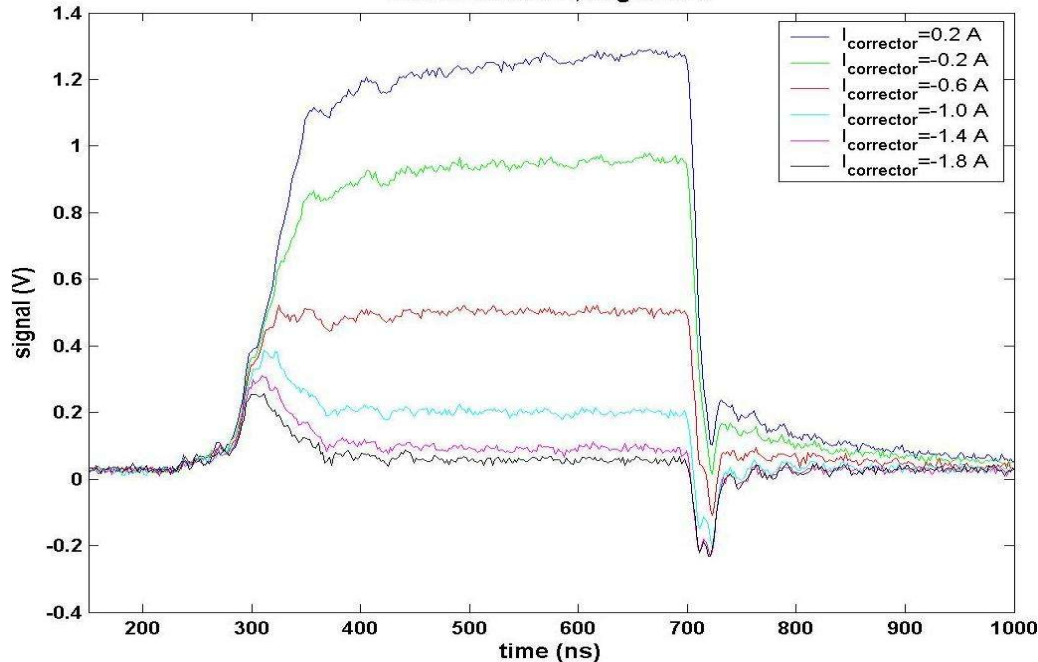


- at the **end of the linac**
- **4 (of 8) channels (4mm) used**
- last corrector scanned
- large / small beam measured
- time resolution OK

Measurement A, signals averaged from 500ns to 700ns

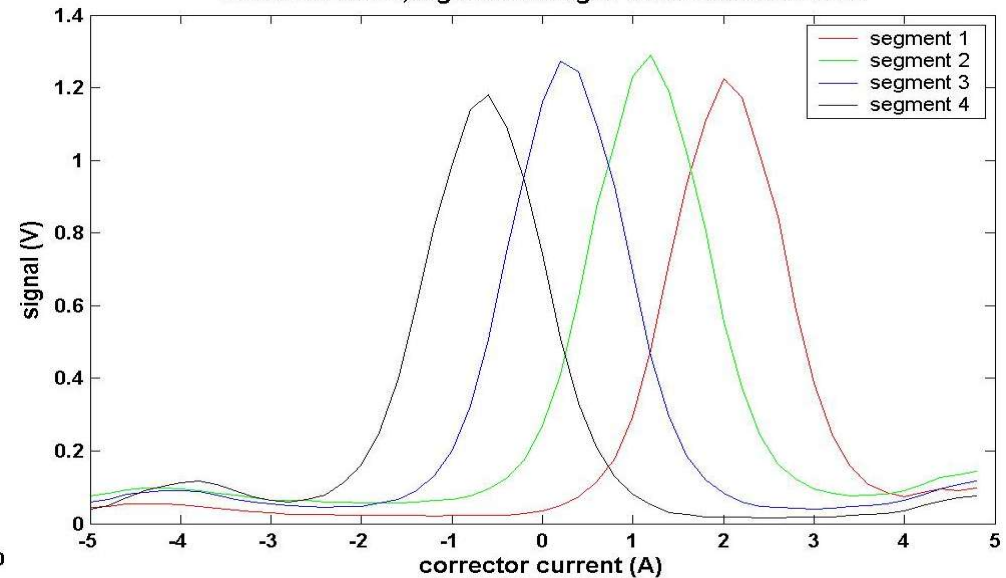


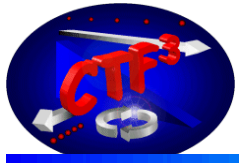
Measurement B, segment 3



H.Braun

Measurement B, signals averaged from 500ns to 700ns

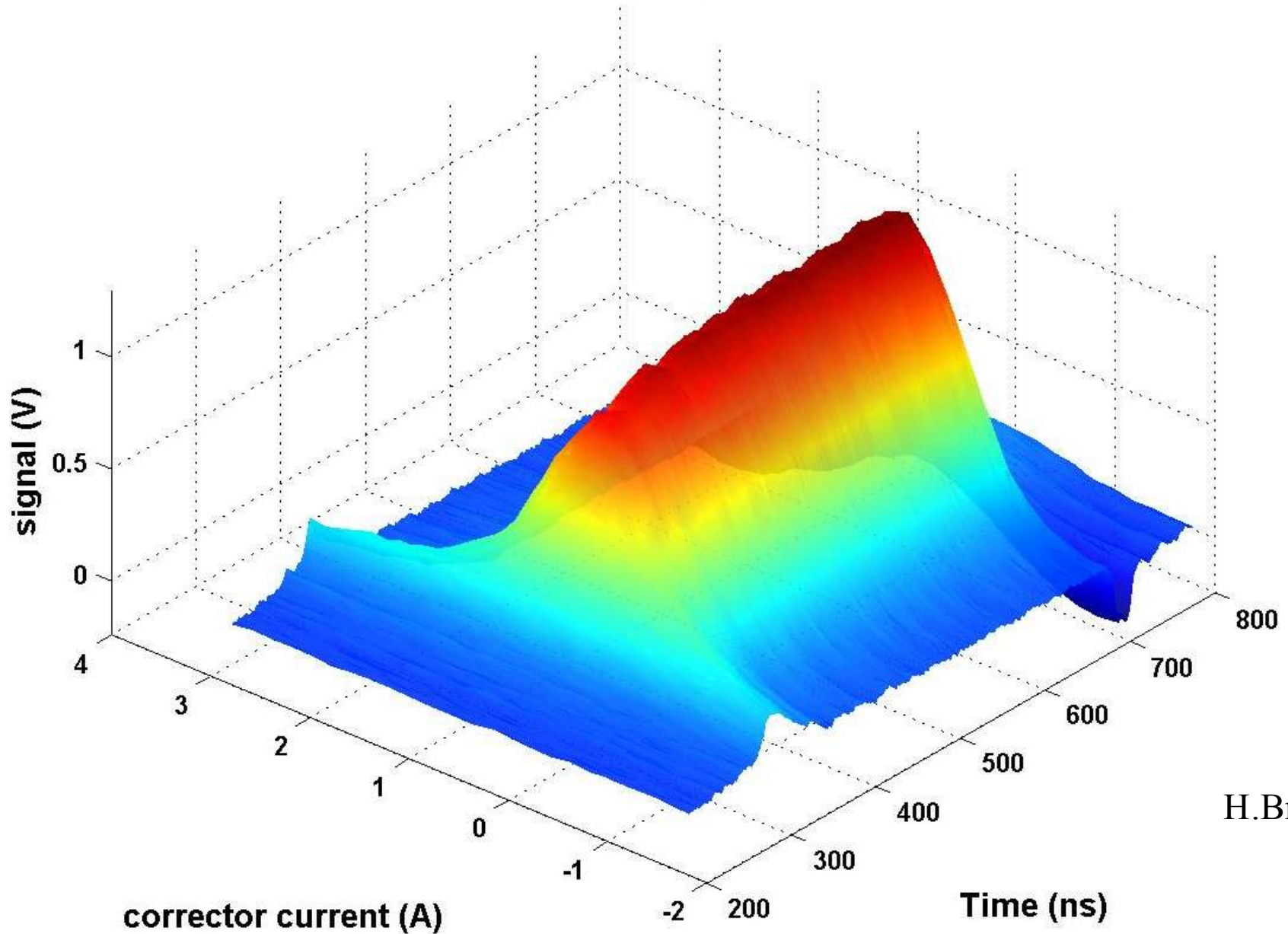




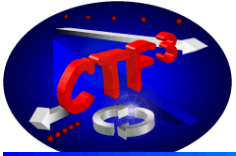
Segmented Dump (2)



Measurement B, segment 3



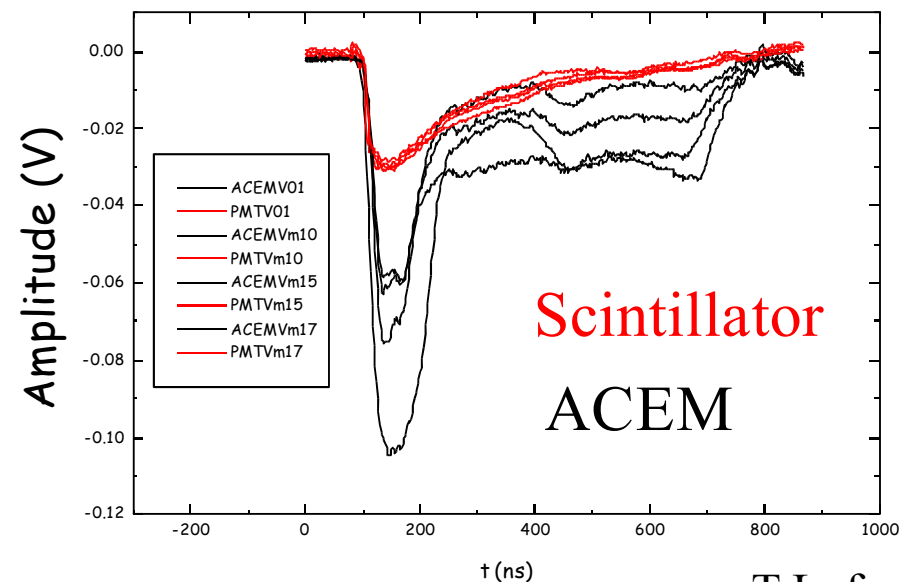
H.Braun



Beam loss monitor tests

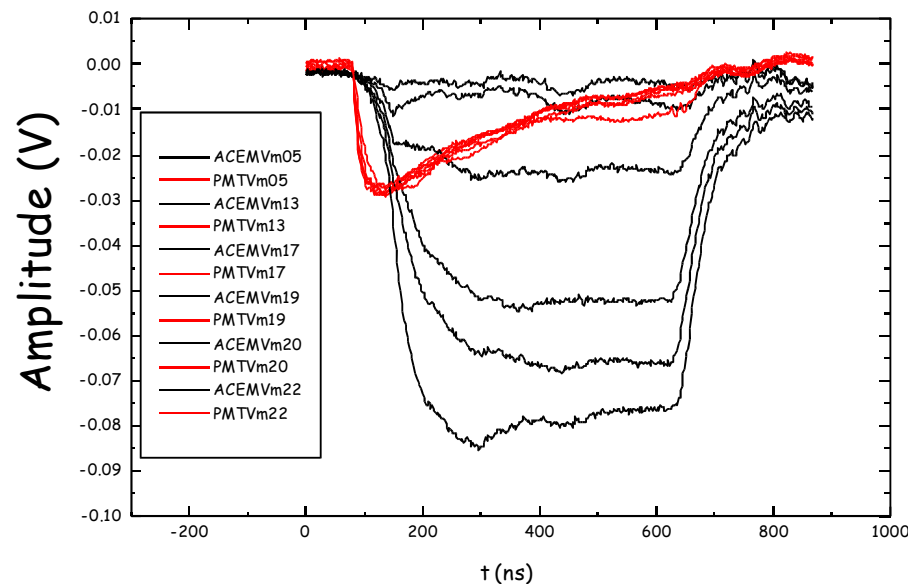
- by North Western University
- 2 different detectors mounted on girder 6
- ACEM / Scintillator
- slit SLH0445
- open: loss of transient seen
- closed: transient loss gone on ACEM
- scintillator dominated by upstream loss
- to be compared to simulation
- 2nd experiment to be analyzed

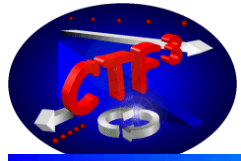
Slit open (31mm)



T.Lefevre

Slit closed (14mm)

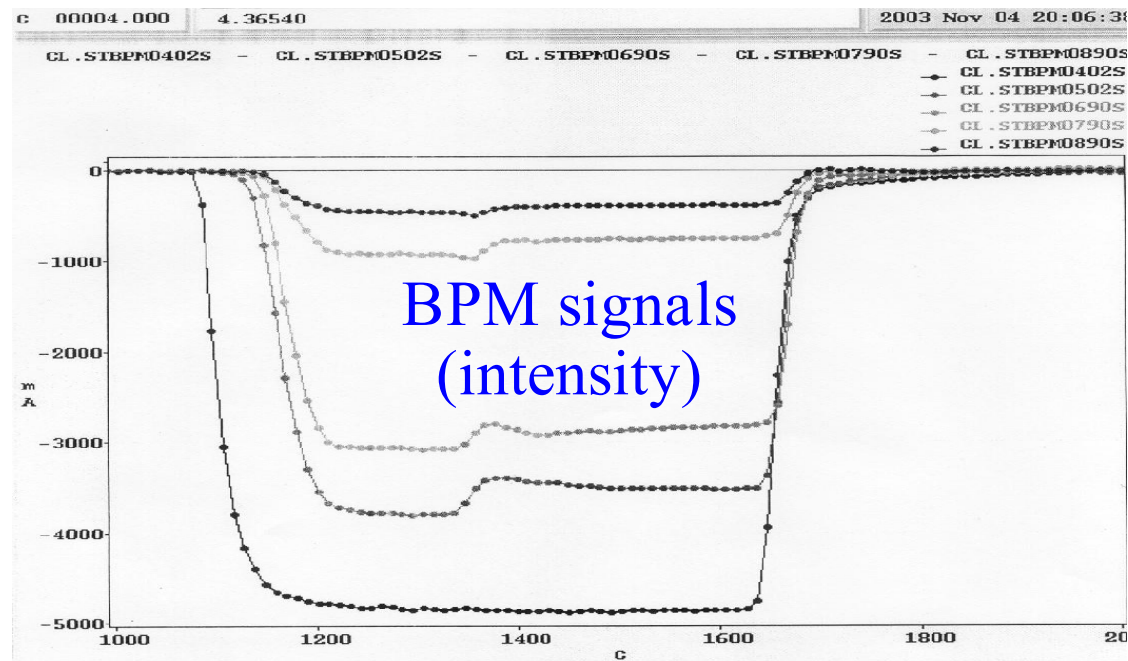
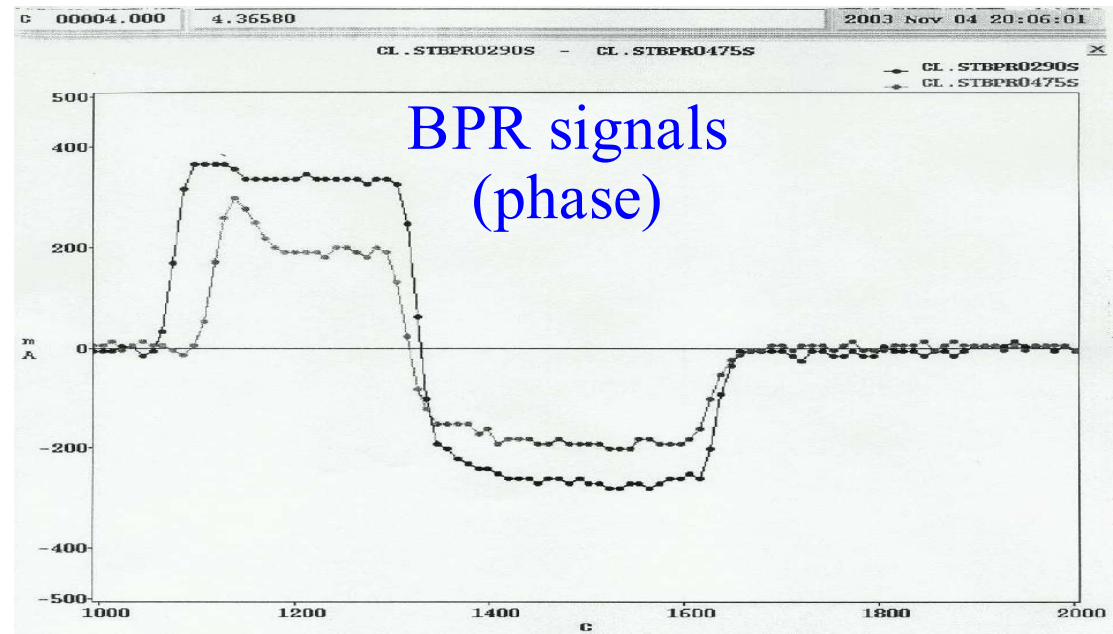


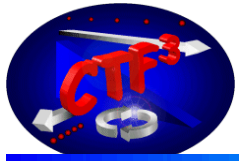


18° phase switch in MKS02



- for 30 GHz RF pulse compression
- MKS02 phase jump $\sim 20^\circ$
- checked with BPR290 and BPR475 ($\sim 13^\circ$) and TDS exit
- MKS03 phase set up for equal beam-loading
- transmission \sim OK





18° phase switch (2)



- 'slit scan' to resolve energy
- MKS03 phase for equal beam-loading
=> energy difference
- adjusted for equal energy
=> energy spread different
- RF compression possible

