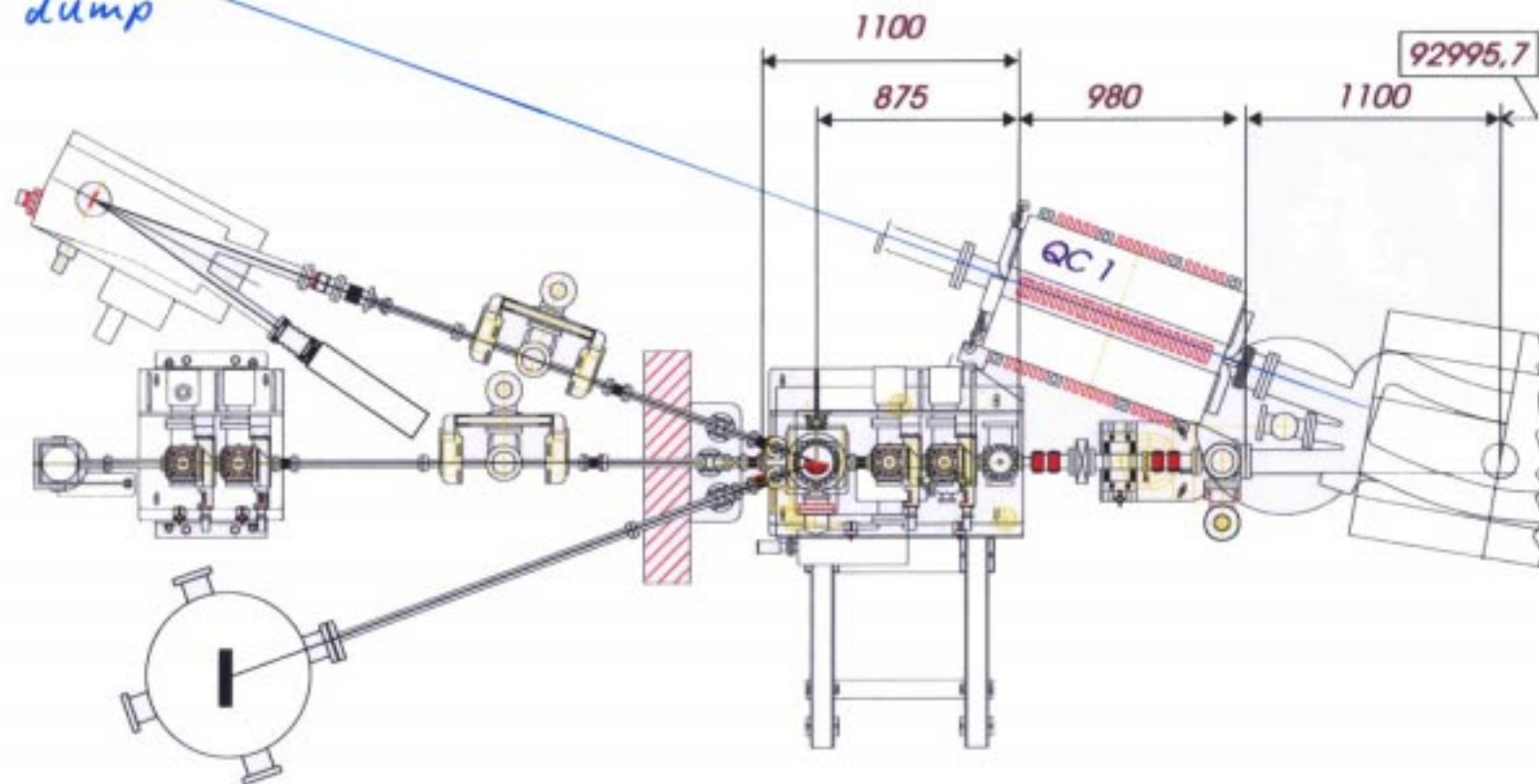


Photon diagnostics and proposed schedule for TTF1

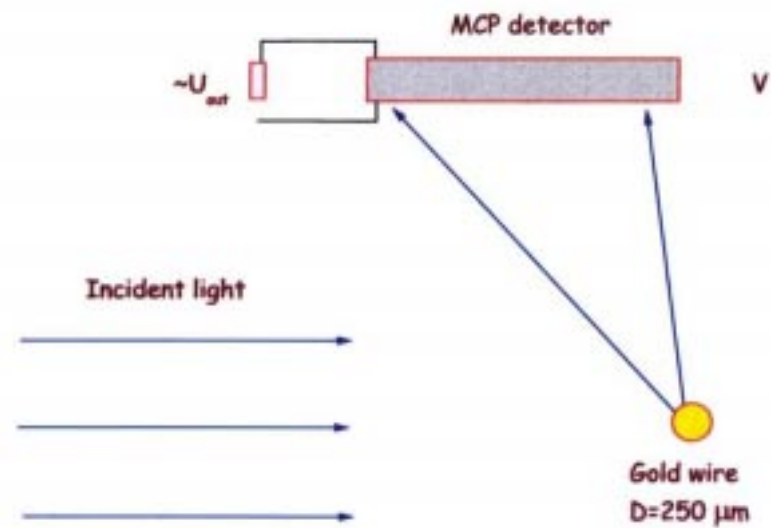
Josef Feldhaus, DESY/HASYLAB

Photon diagnostic

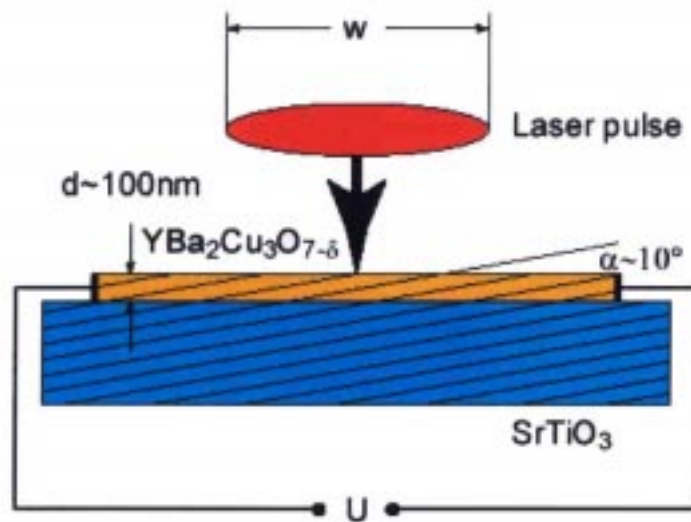
e^- beam dump



MCP-based nondestructive photon detector with dynamic range of seven orders of magnitude



Thermopile detector

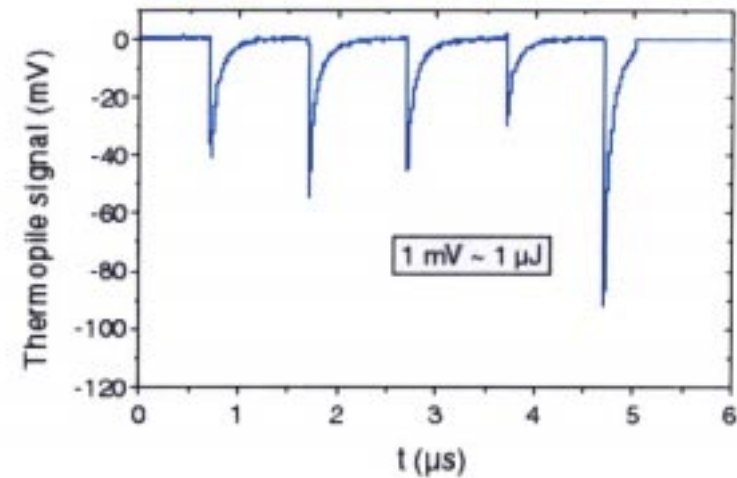


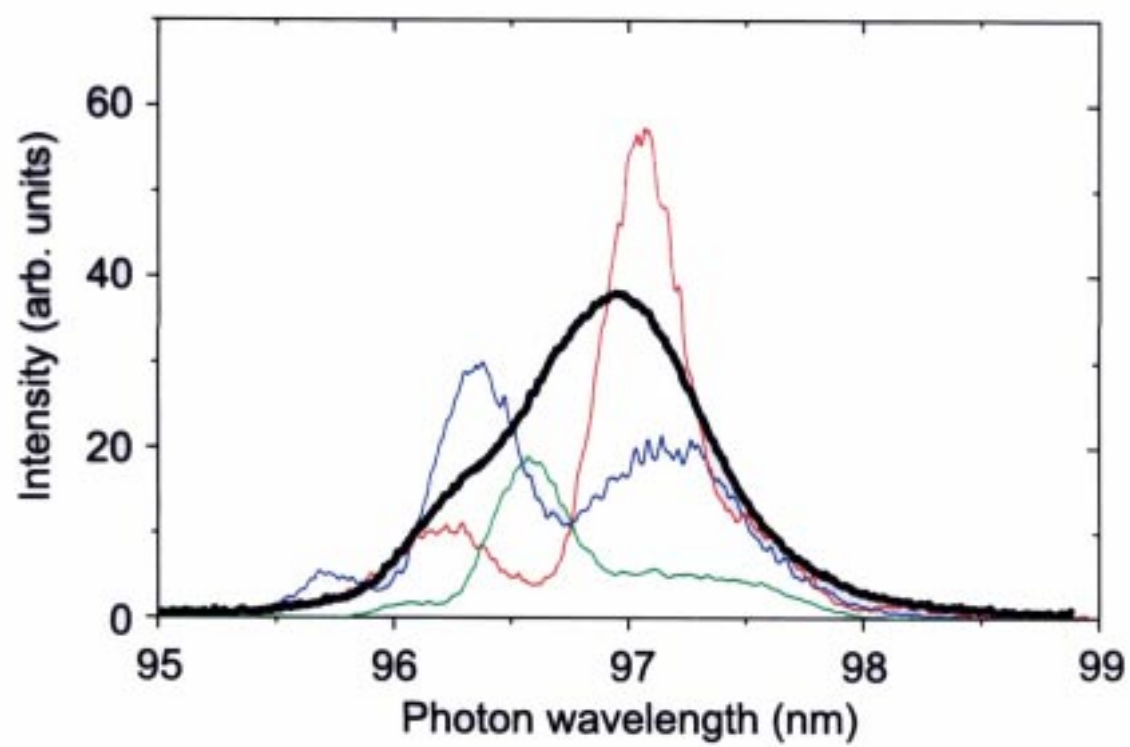
$$U = \Delta S \cdot \Delta T \cdot \alpha \cdot w / d \sim 0.5 \text{ V/K}$$

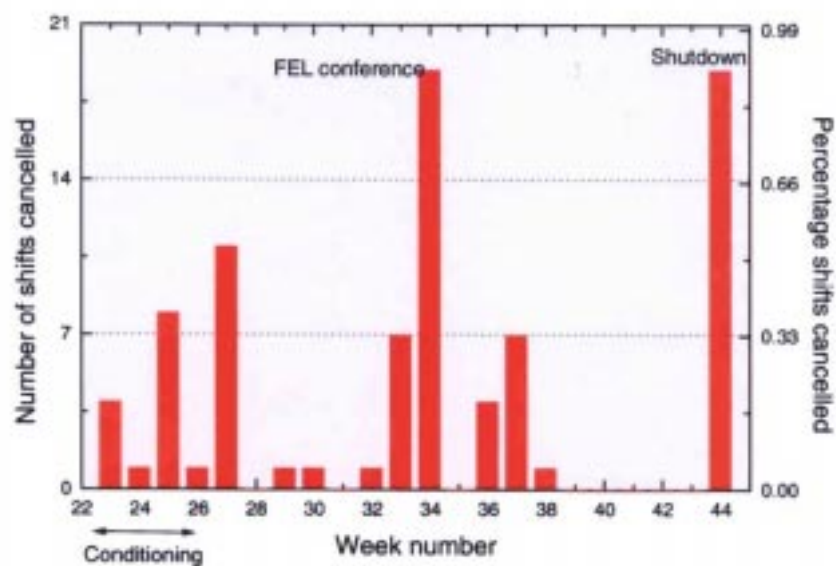
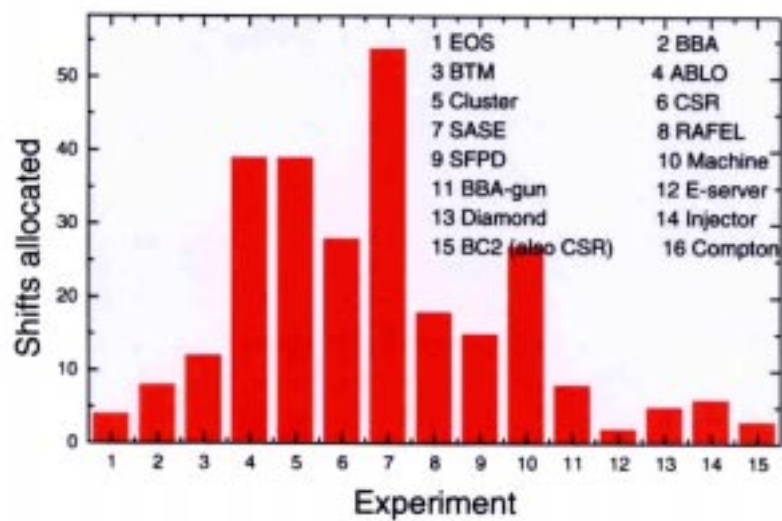
$$\Delta S = -10 \text{ } \mu\text{V/K}$$

Sensitivity for pulses: $\sim 1 \text{ mV}/\mu\text{J}$
 Response time: $\sim 10 \text{ ns}$

TTF1 data Sept. 2001







Last update: October 20, 2001

Experimental program TTF Phase 1

Experiment	Responsible persons	Status	Ded. Shifts	Done
Finish before 7. May 2001				
Cavity (diag. Blocks) BPMs	Zeuthen, Schmidt			
Waveguide BPMs (und. 3)	Zeuthen, Schmidt, Castro			
Antenna BPMs (und. 1,2)	Wendt, Castro			
BPMs, wire, SR	Schmidt	available		
Maximize FEL gain				
Laser pulse short upgrade	Will, Schreiber			
Injector parametric experiments	Castro, TU-Darmstadt	available	4	7
Injector parametric studies	Cianchi, Krassilnikov (TUD), Piot et al.	available	17	
Capture cavity transfer matrix	Piot	available	4	Kw45
Bunch compression and beam dynamics	Piot	available	46+46	28
Beam based alignment	Castro, Faatz	available	12	8
Orbit response meas.	Castro	available	5	
Slow feedback	Castro			
B.T.M.	Ischebeck		22	12
<i>Sub-total</i>			110+46	46
SASE				54
FEL diagnostics and exp.				
Photon Diagnostics	Feldhaus, Treusch et al.	available	92	15
RAFEL	Faatz, Schneidmiller	available	25	18
Ablation and plasma exp.	Krzywinski, Sobierajski	available	84	39
Cluster exp.	Moeller	available	84	39
<i>Sub-total</i>			285	111
Diagnostic development				
EXPI synchr. Light exp.	Schmidt, Plucinski			
Laser wire	Schreiber			
Electro-optical sampling	Loos, Hessler, Türke, Simrock	available	12	4
Beam phase jitter	Gerth	available	10	
SEM grid exp.	Hensler, Garvey			
Slow wire scanner	Zeuthen, Castro			
Diffraction rad. Exp.	Honkavaara, Castellano			
Josephson junct.	Menzel, Hamburg Uni	available	5	
<i>Sub-total</i>			>27	4
Machine development				
Long pulse mode				
Feedback	Balewski, Duhme, Klute	available	3	
Cathode experiments	Sertore	available	5	Kw46
LLRF exp.	Simrock			
Lorentz force detuning	Simrock			
Energy coll. in BC2	Schmidt			
Neutron dosimeter	Leuschner	available	2	
HOM part 2	Balakin et.al, Weise			
Transverse kick	Napoli			
Machine diag.+ setup				27
<i>Sub-total</i>			>2	
Total			>472¹	>161

¹Operation: 5.6.2001 - 1.3.2002 = 241

Operation: 5.11.2001 - 17.3.2002 = 132 days until high gradient test

- 11 days around Christmas - 25 days total for one shutdown to change experiments = 107 days = **320 shifts**

Tentative FEL program until May 2002

- **RED** shifts are fixed: external or large group of people involved
 - **BLUE** shifts are should NOT be shifted: has to be finished during this run
- ABLO:** Ablation experiment; **BBA:** Beam Based Alignment; **RAFEL:** Regenerative Amplifier FEL.
SFPD: SASE FEL Photon Diagnostics; **BTM:** Beam Trajectory Monitor, **EOS:** Electro-optical sampling.

Week 45: 11 shifts (05/11/01-11/11/01): **EXCHANGE BC2 Chamber/Kly. 2/Kryo (Monday)**

Description	No. of shifts	Timeslot	Remarks
Shutdown to exchange BC2 chamber			
During night conditioning/machine study			
Install new MCP and gas-cell detector			

Week 46: 11 shifts (12/11/01-18/11/01): **EXCHANGE BC2 Chamber/Kly. 2**

Description	No. of shifts	Timeslot	Remarks
Shutdown to exchange BC2 chamber			
Prepare for run, connect BC2 to module			

Week 47: 11 shifts (19/11/01-25/11/01): **Reinstall connection ACC1 & ACC2**

Description	No. of shifts	Timeslot	Remarks
Perform Dark current measurement	2		
Startup machine	6		

Week 48: 21 shifts (26/11/01-02/12/01)

Description	No. of shifts	Timeslot	Remarks
Machine studies + getting SASE back	21		

Week 49: 21 shifts (03/12/01-09/12/01)

Description	No. of shifts	Timeslot	Remarks
ABLO	9		
SFPD/RAFEL/SASE	11		4x gas detect.

Week 50: 21 shifts (10/12/01-16/12/01)

Description	No. of shifts	Timeslot	Remarks
Machine studies	21		12x CSR

Week 51: 14 shifts (17/12/01-23/12/01): **Xmas**

Description	No. of shifts	Timeslot	Remarks
ABLO	8		
SFPD/RAFEL/SASE	3		
Switch off machine	2		

Week 52: 0 shifts (24/12/01-30/12/01)

Description	No. of shifts	Timeslot	Remarks
No shifts planned			

Week 1: 15 shifts (31/12/01-6/01/02)

Description	No. of shifts	Timeslot	Remarks
Startup + get SASE back	8		
ABLO	4		
SFPD/RAFEL/SASE	3		

Week 2: 21 shifts (07/01/02-13/01/02)

Description	No. of shifts	Timeslot	Remarks
Machine studies	18		

Week 3: 21 shifts (14/01/02-20/01/02)

Description	No. of shifts	Timeslot	Remarks
ABLO	14		
SFPD/RAFEL/SASE	7		

Week 4: 7 shifts (21/01/02-27/01/02)

Description	No. of shifts	Timeslot	Remarks
EXCHANGE ABLO for CLUSTER			
Machine study when possible	7		

Week 5: 21 shifts (28/01/02-03/02/02)

Description	No. of shifts	Timeslot	Remarks
Machine studies	21		12x CSR

Week 6: 21 shifts (04/02/02-10/02/02)

Description	No. of shifts	Timeslot	Remarks
CLUSTER	7		
SFPD/RAFEL/SASE	14		6x gas detect.

Week 7: 21 shifts (11/02/02-17/02/02)

Description	No. of shifts	Timeslot	Remarks
Machine studies	21		12x CSR

Week 8: 21 shifts (18/02/02-24/02/02)

Description	No. of shifts	Timeslot	Remarks
CLUSTER	14		
SFPD/RAFEL/SASE	7		

Week 9: 21 shifts (25/02/02-03/03/02)

Description	No. of shifts	Timeslot	Remarks
Machine studies	21		12x CSR

Week 9: 21 shifts (04/03/02-10/03/02)

Description	No. of shifts	Timeslot	Remarks
CLUSTER	14		12x CSR
SFPD/RAFEL/SASE	7		

Week 10: 21 shifts (11/03/02-17/03/02)

Description	No. of shifts	Timeslot	Remarks
Machine studies			

Week 10: 21 shifts (18/03/02-24/03/02)

Description	No. of shifts	Timeslot	Remarks
High gradient test			

Week 10: 21 shifts (25/03/02-31/03/02)

Description	No. of shifts	Timeslot	Remarks
High gradient test			

Week 10: 21 shifts (01/04/02-07/04/02)

Description	No. of shifts	Timeslot	Remarks
High gradient test			

Week 10: 21 shifts (08/04/02-14/04/02)

Description	No. of shifts	Timeslot	Remarks
High gradient test			

Week 10: 21 shifts (15/04/02-21/04/02)

Description	No. of shifts	Timeslot	Remarks
High gradient test			

Week 10: 21 shifts (22/04/02-28/04/02)

Description	No. of shifts	Timeslot	Remarks
High gradient test			

Proposed Schedule for TTF1

