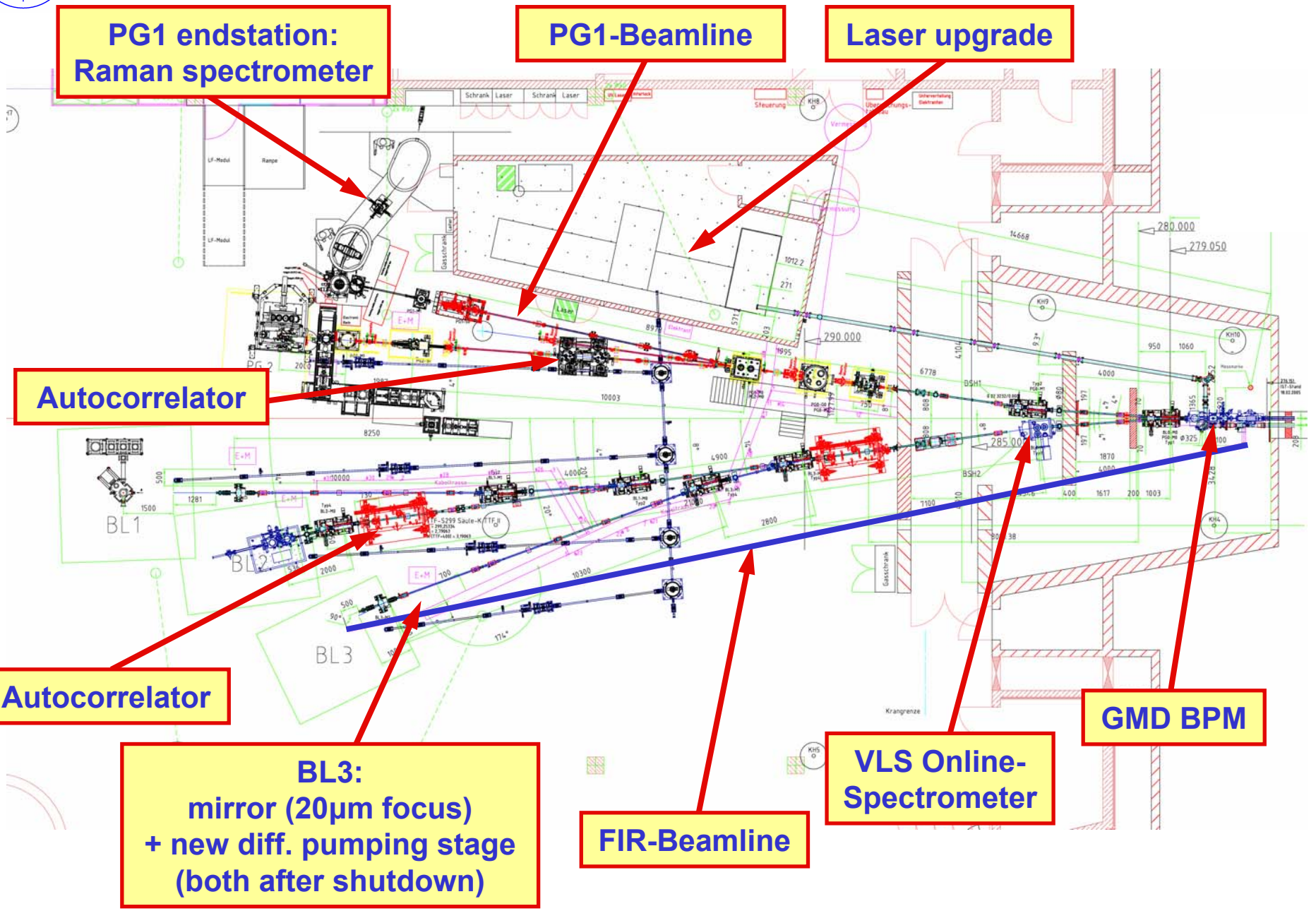
Update on FLASH user infrastructure:

Changes in the experimental Hall

Rolf Treusch

DESY - FS


PG1 endstation:
Raman spectrometer
PG1-Beamline
Laser upgrade
Autocorrelator
Autocorrelator
BL3:
mirror (20µm focus)
+ new diff. pumping stage
(both after shutdown)
FIR-Beamline
VLS Online-
Spectrometer
GMD BPM
BL1
BL2
BL3

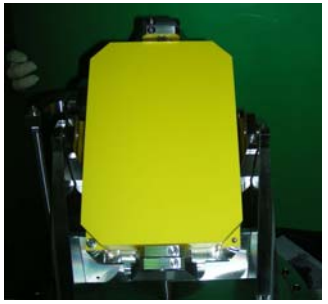
- FIR beamline and experimental stations
- VLS Online-Spectrometer
- Beam position monitor in GMD
- Optical laser upgrade
- PG1 beamline + endstation (DESY / Uni HH)
- Autocorrelators: 1. Univ. HH
  2. BESSY / Univ. Münster
- Focusing mirror (20μm) option at BL3
- new alignment lasers for individual beamlines,
  modification of photon beam monitor screens,
  motorization + new filter foils for harmonic suppression (BL2),
  …

FIR beamline and exp. stations

where the FIR beamline wil… …ports 1 and 2

FIR beamline installation in accelerator tunnel started in KW 19 (as planned)

…danian holder for SPK1



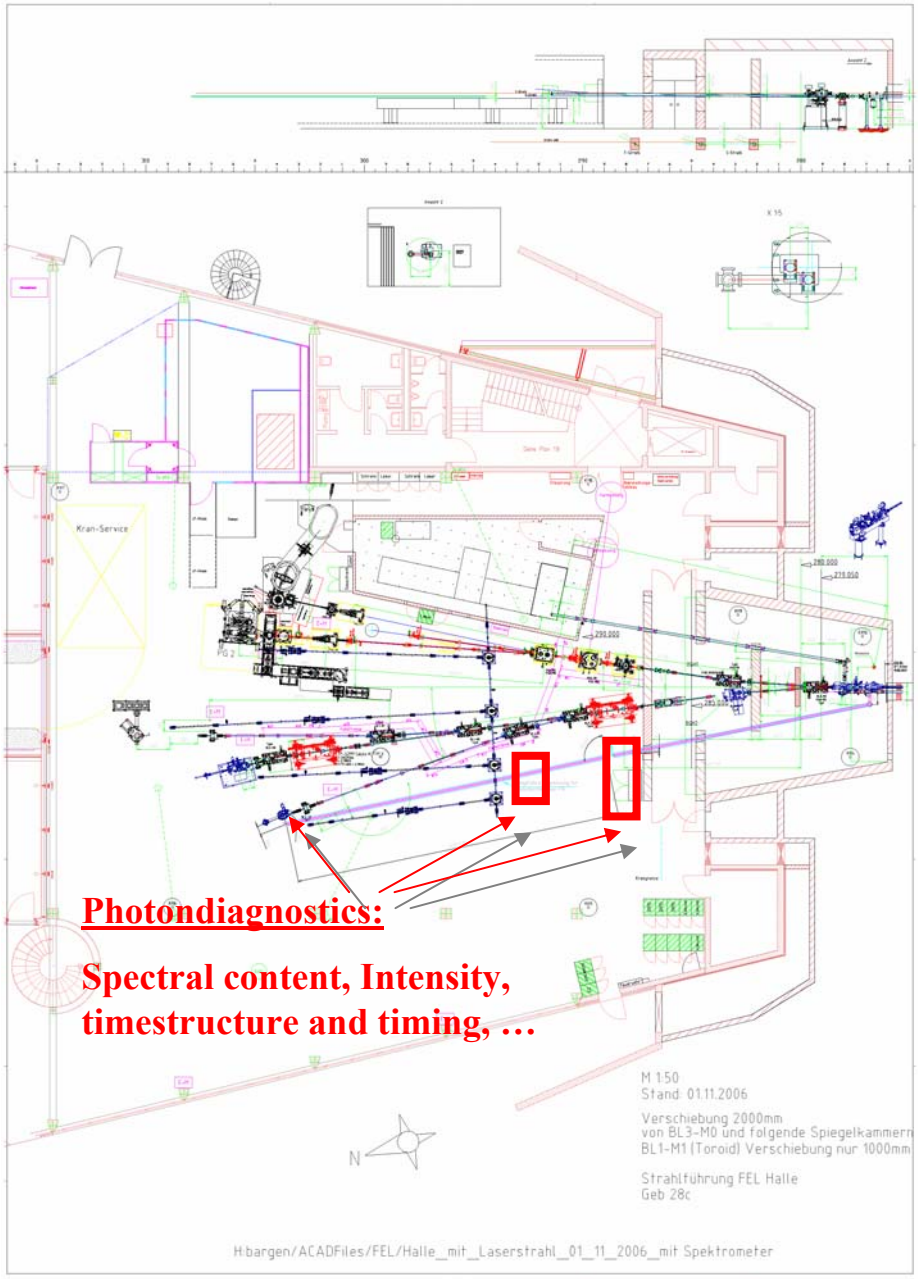
Cardanian holders for SPK2/3

SPK1

Stone for SPK1/2

Column for SPK1

M.Gensch et al.



HASYLAB & collaborators

Spectral content

-Scanning dispersive spectrometer

(collab. with FLA/AG Rossbach/FZ Rossendorf)

Martin Puplett Spectrometer

(collab. with U. Schade/BESSY)

-Single shot dispersive spectrometer

(collab. with H. Delshemi, B. Schmidt/FLA; W. Seidel/FZ Rossendorf)

Timestructure/Timing:

- Direct measurement with Hot Electron Bolometer

(collab. with H.W. Hübers/DLR)

-Single shot E/O measurements (spatial and/or spectral decoding)

(collab. S. Duesterer, A. Azima + FLA)

Polarization/Beamprofile

-Single shot Polarimeter

(collab. with BESSY/FZ Rossendorf)

Intensity

-Scanning intensity monitor

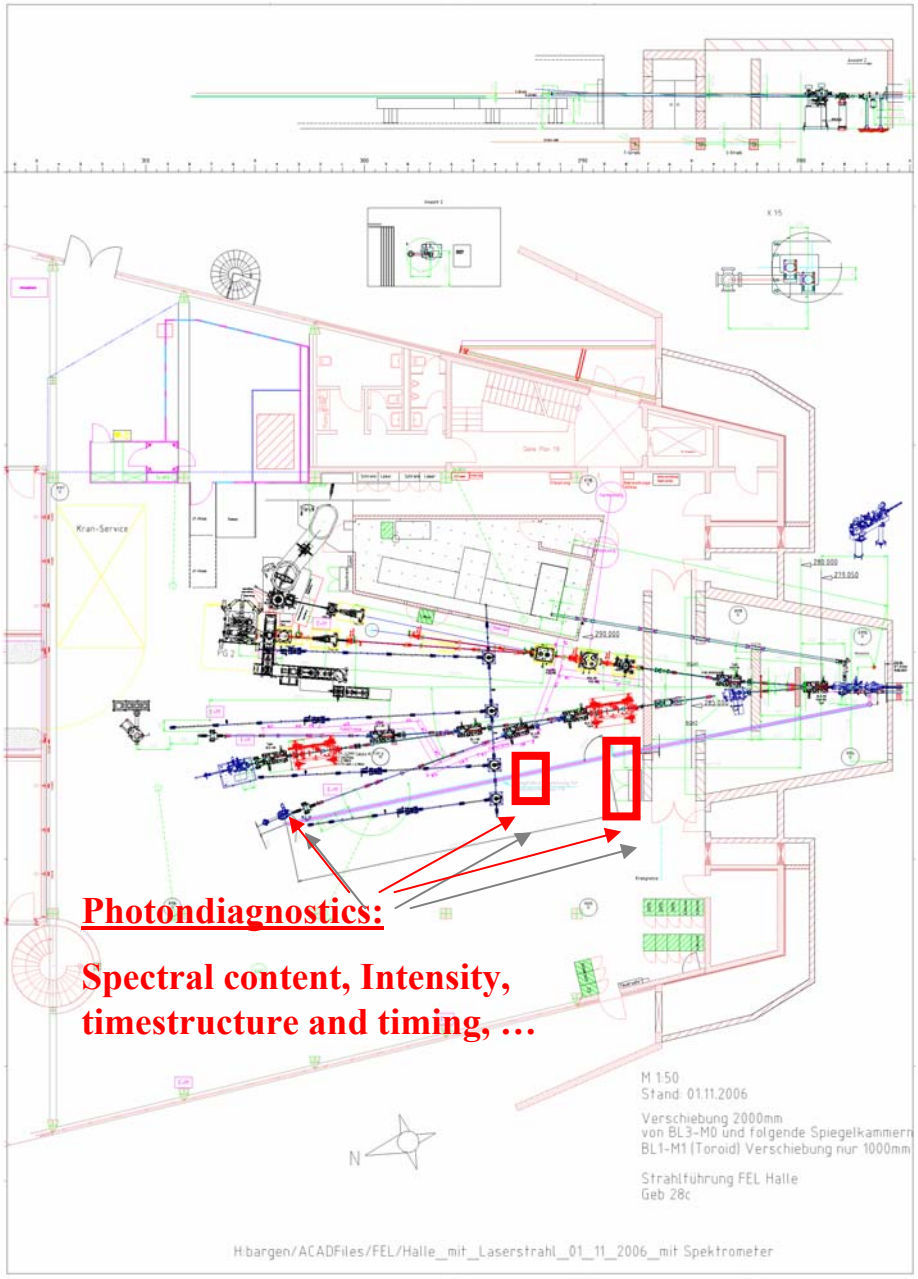
(collab. with AG Rossbach)

VUV/FIR spatial and temporal overlapp

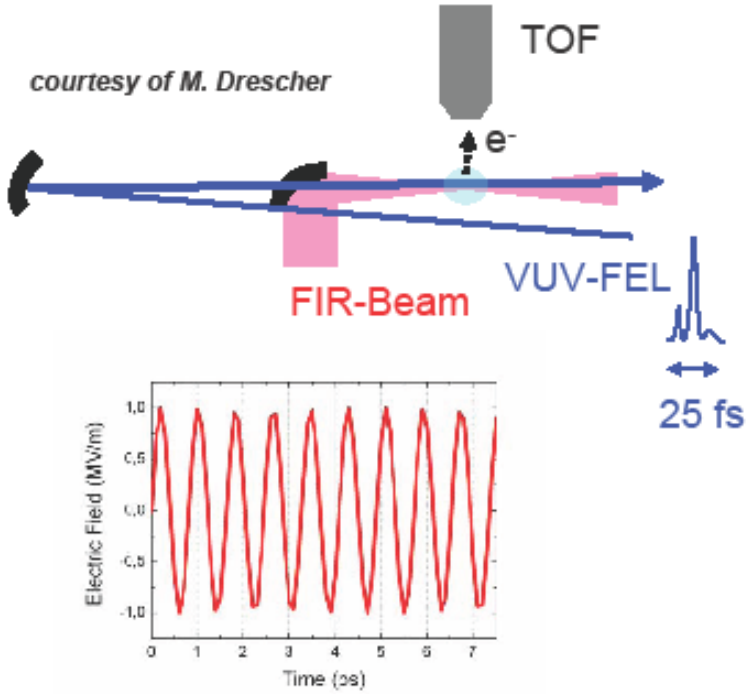
-THz streak camera

(collab. with AG Drescher)

courtesy of M. Gensch



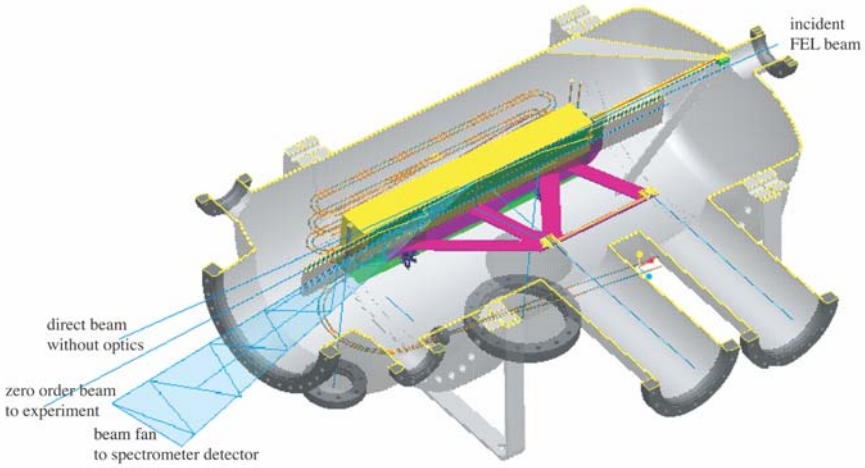
THz streak camera for timestructure determination of FLASH



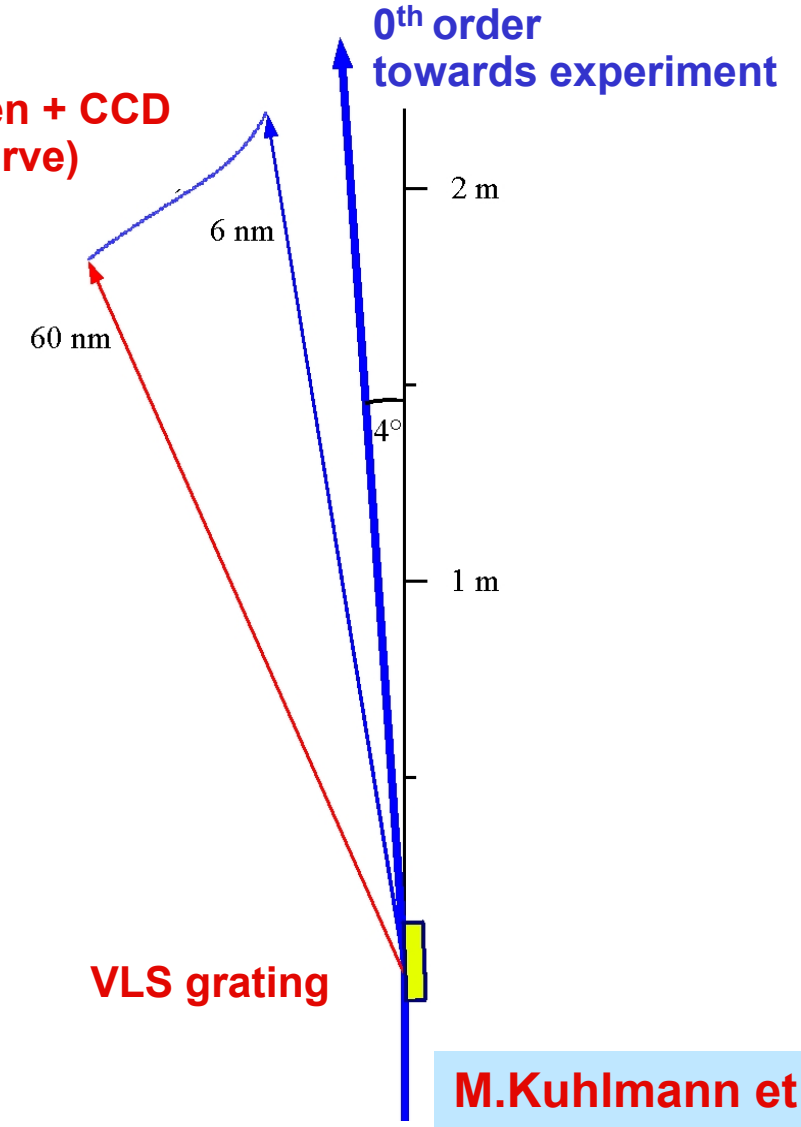
courtesy of M. Gensch

VLS Online-Spectrometer

- use grating as mirror
- reflect only some percent into 1st order and about 80% in 0th order towards experiment
- main challenge: line detector readout at 1 MHz

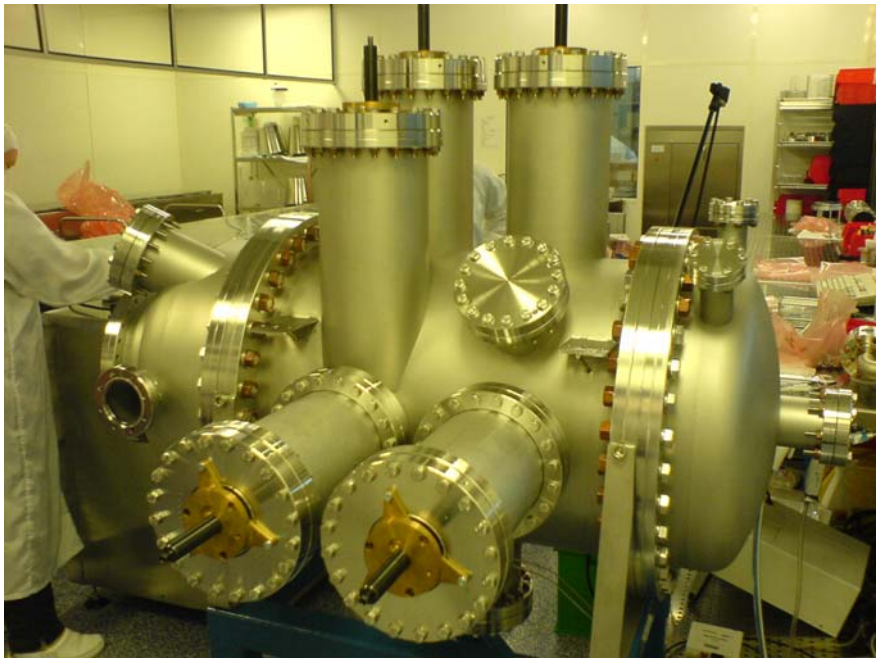


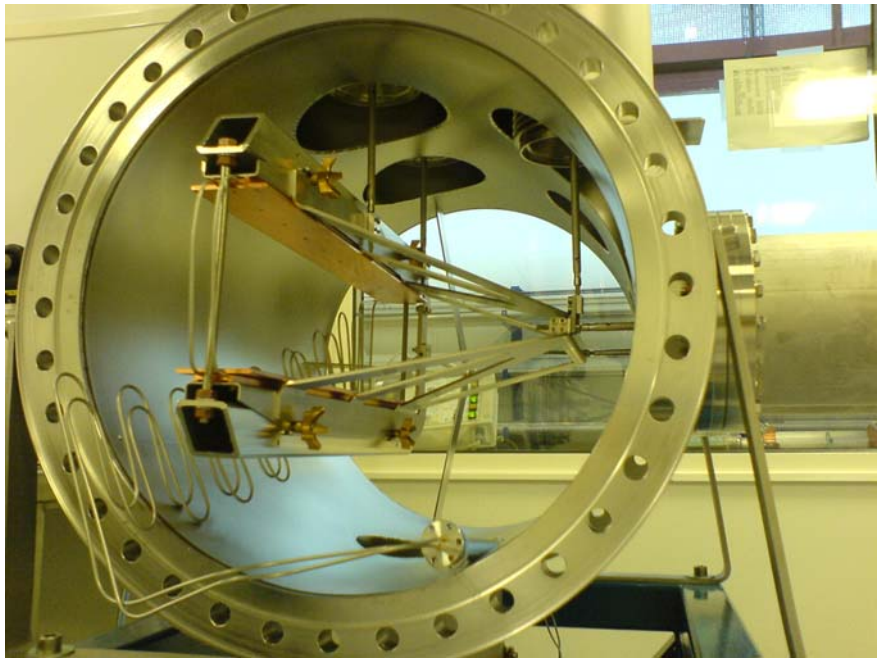
Spectrometer (screen + CCD move along focal curve)



M.Kuhlmann et al.

VLS Online-Spectrometer

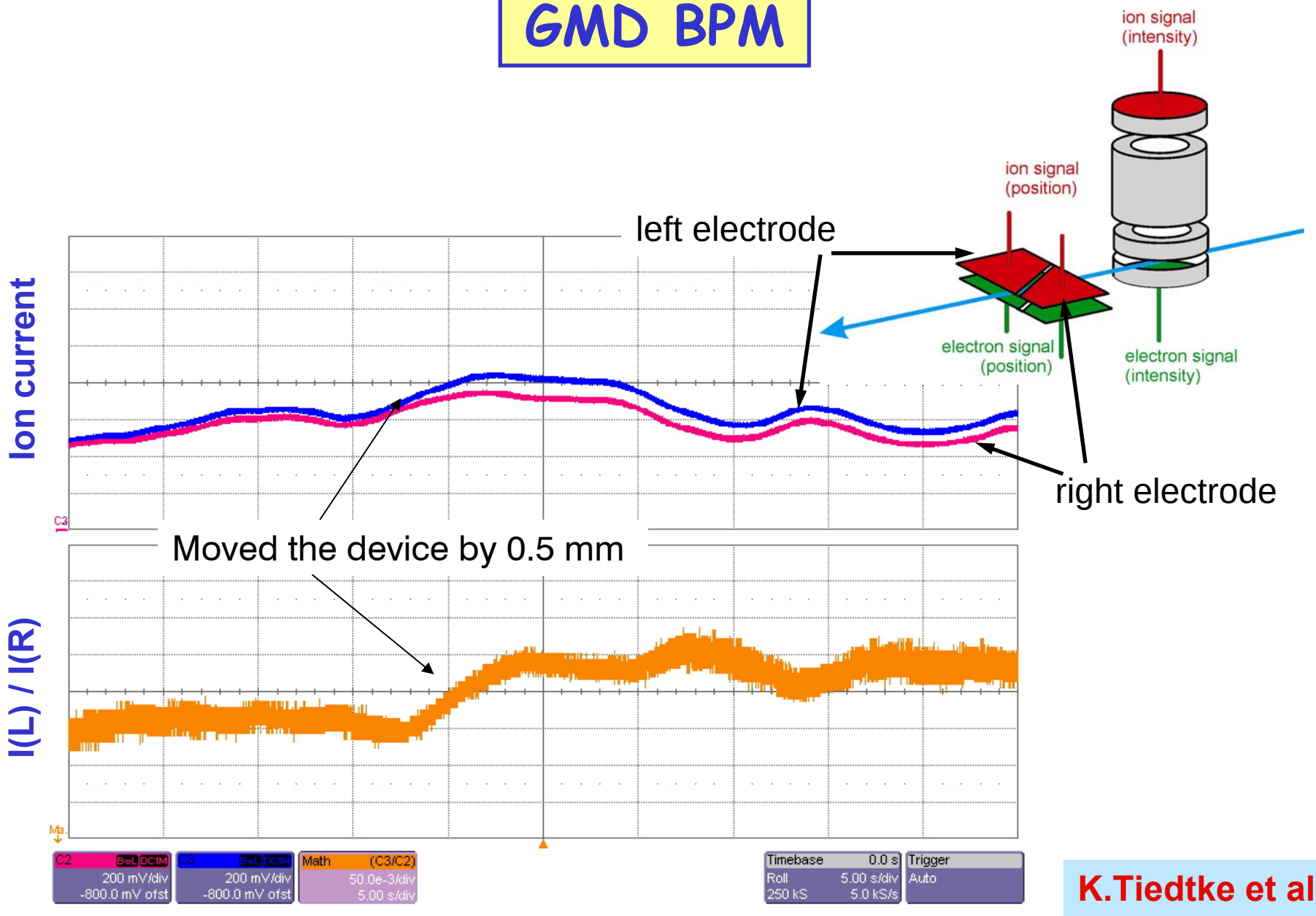




presently assembly
in the cleanroom

M.Kuhlmann et al.

GMD BPM



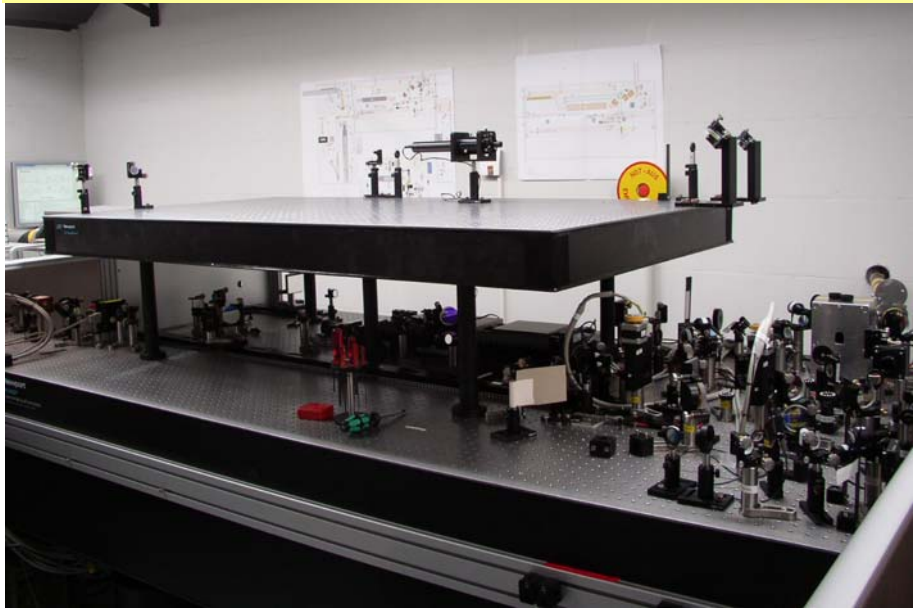
K.Tiedtke et al.

Optical Laser Upgrade

Presently: 800nm, 120 fs, up to 30µJ, with pulse pattern of FLASH

Adding second laser system: 800nm, 100fs, 25mJ, 5/10Hz (one pulse per FLASH pulse train)

new laser table stacked on top of original laser…

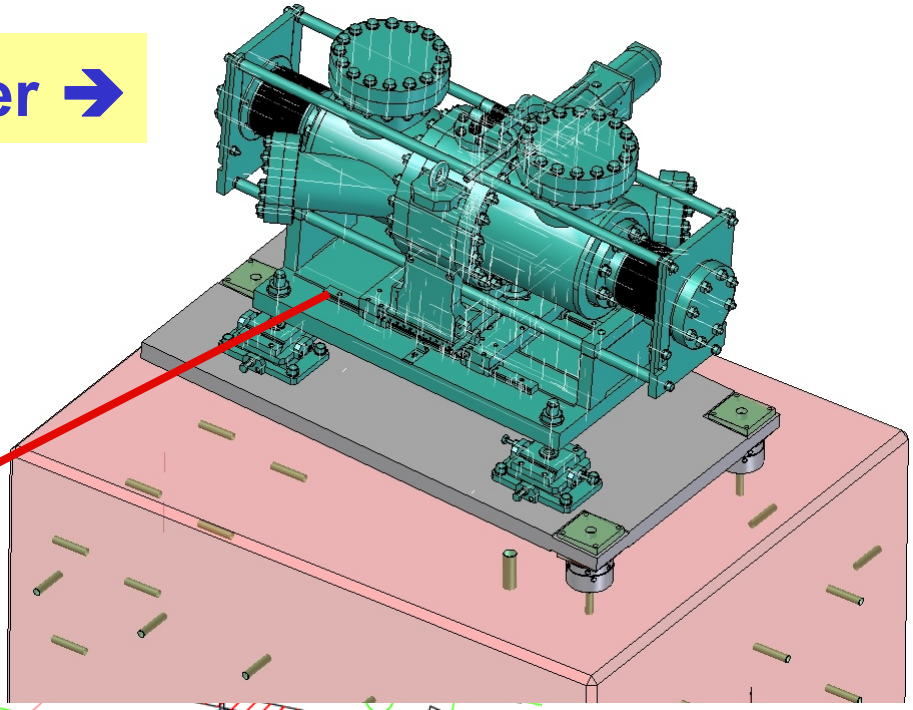


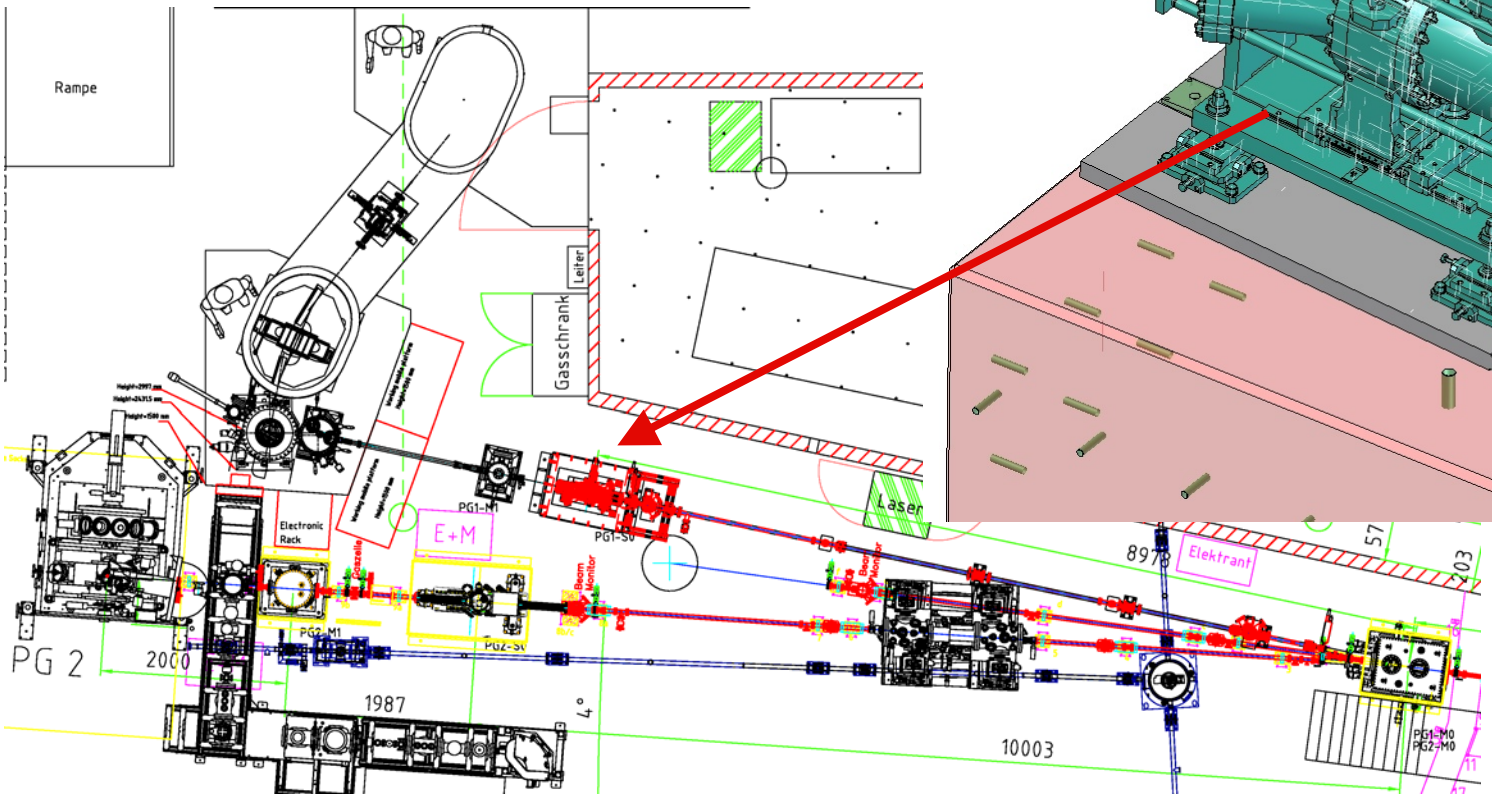
… with Hidra laser mounted

S.Düsterer, H.Redlin et al.

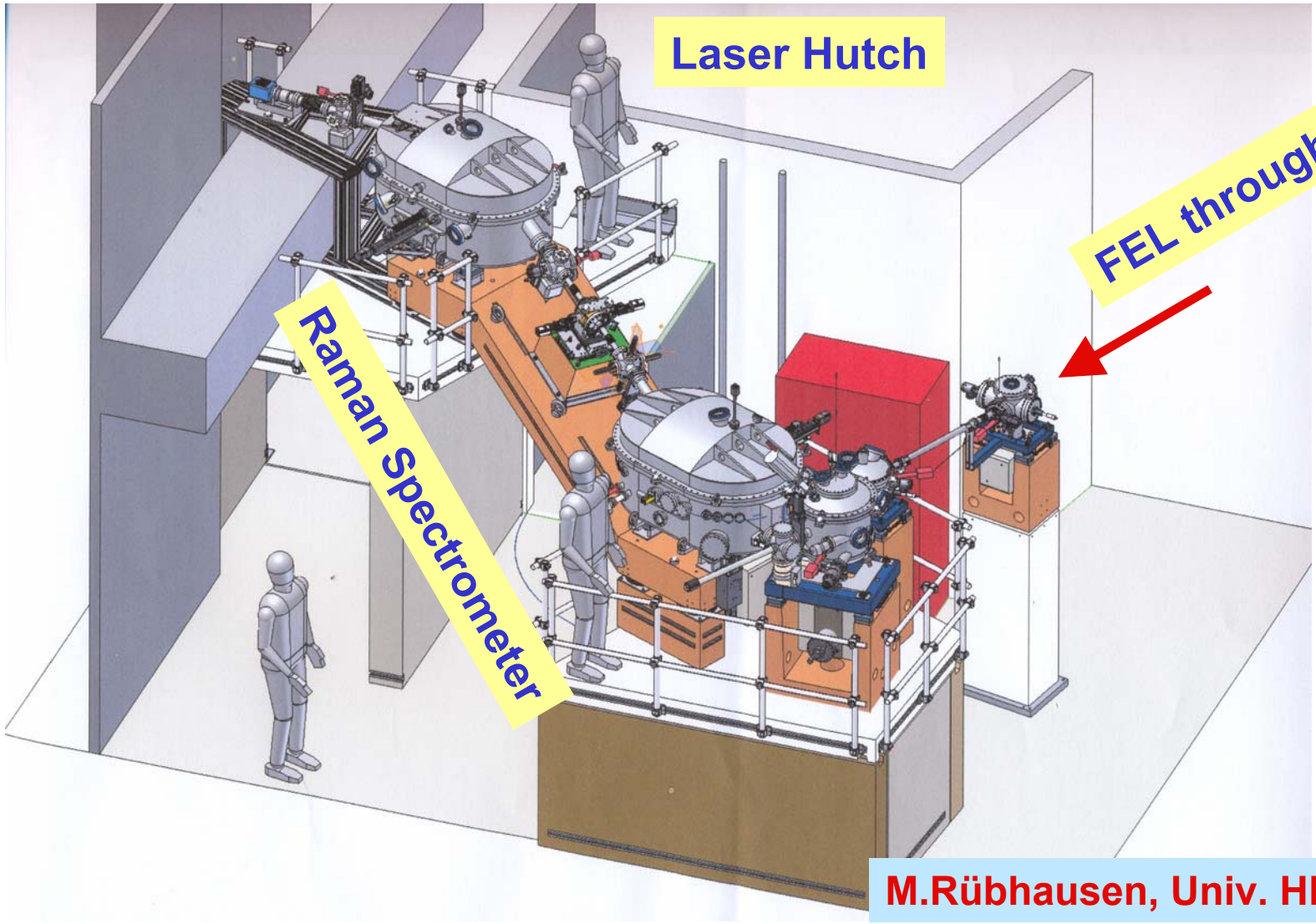
PG1 beamline

Exit slit chamber ➔





PG1 endstation

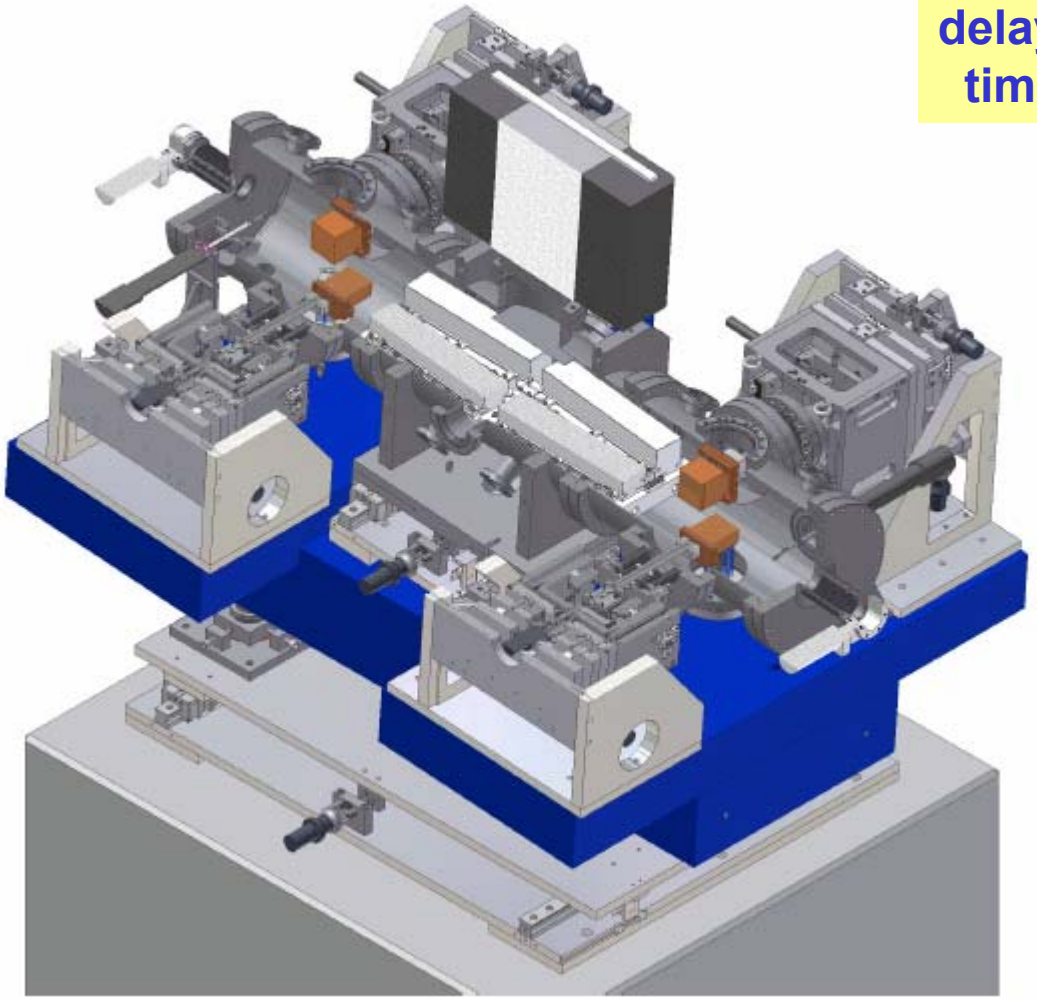


M.Rübhausen, Univ. HH et al.

- project of Univ. HH together with DESY/HASYLAB
- granite and concrete supports are put in place right now
- spectrometer will come end of the year after final ex-situ alignment and tests

Status 23.05.2007

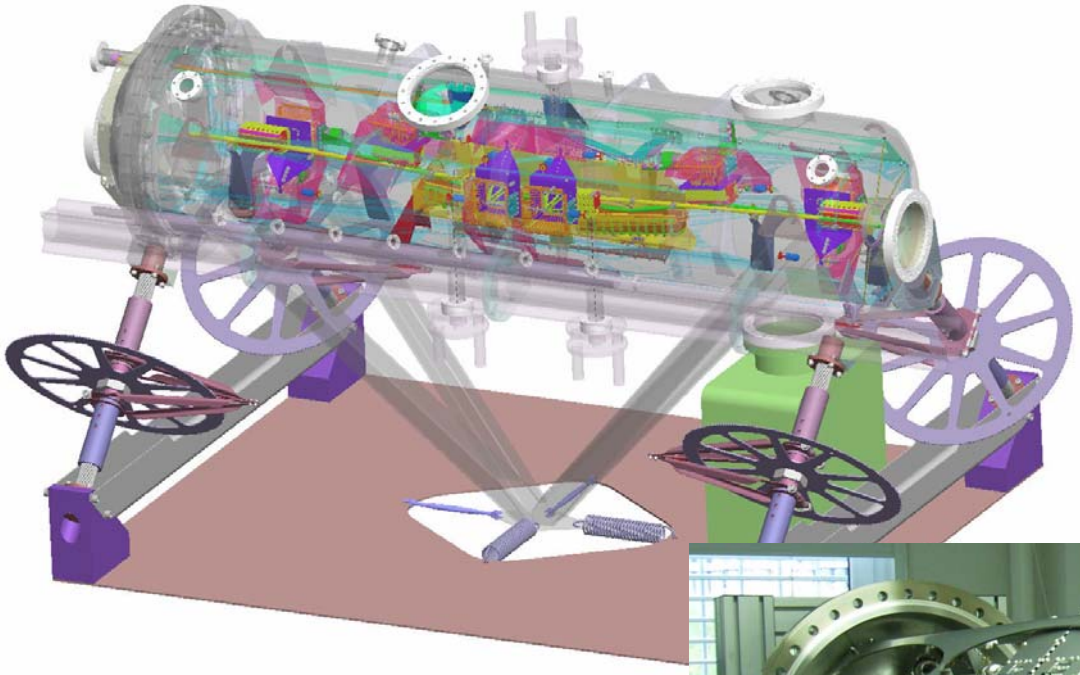
Autocorrelator (Univ. HH)



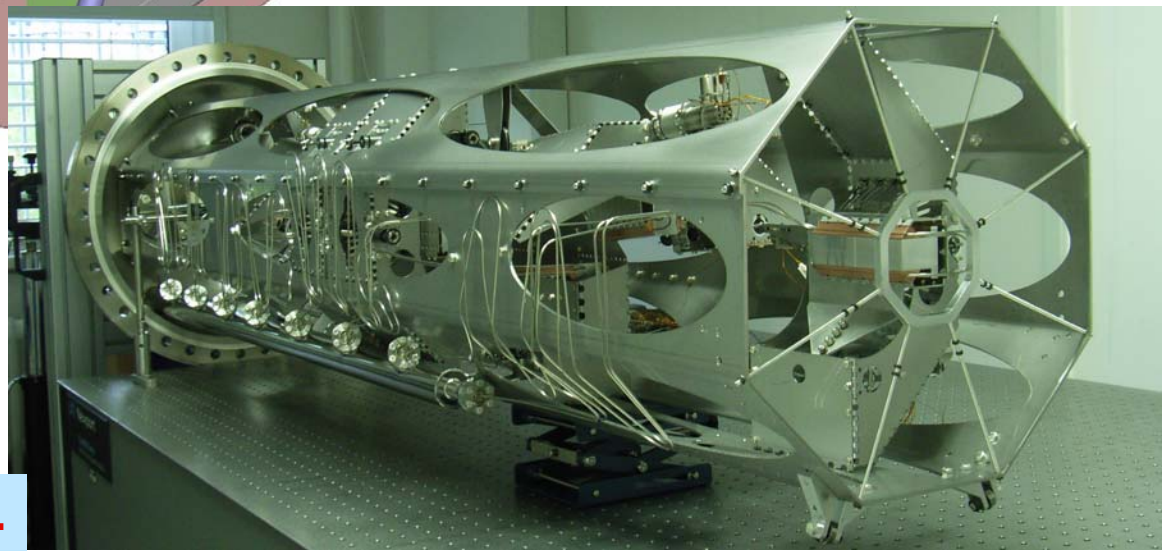
delay scan range : 20 ps
time resolution : ≤10 fs

W.Wurth, A.Föhlisch et al.

Autocorrelator (BESSY, Univ. Münster)



delay scan range : 20 ps
time resolution : ≤ 1 fs



presently tested with
pulsed optical lasers

R.Mitzner (Univ. Münster) et al.

Focusing mirror @ BL3

- BL3 will become alternative to heavily overbooked BL2
- mirror chamber with ellipsoidal mirror identical to the one at BL2 for 20μm focus will be installed
- modified differential pumping chamber behind mirror chamber and connecting to experiment will allow to use both, either focused or unfocused beam, depending on experimental needs

U.Hahn, M.Hesse et al.

Summary

a damn´ lot of work …

… but exciting times!