

Optical Replica Synthesizer

- Active participants:



- G. Angelova, V. Ziemann, Uni Uppsala

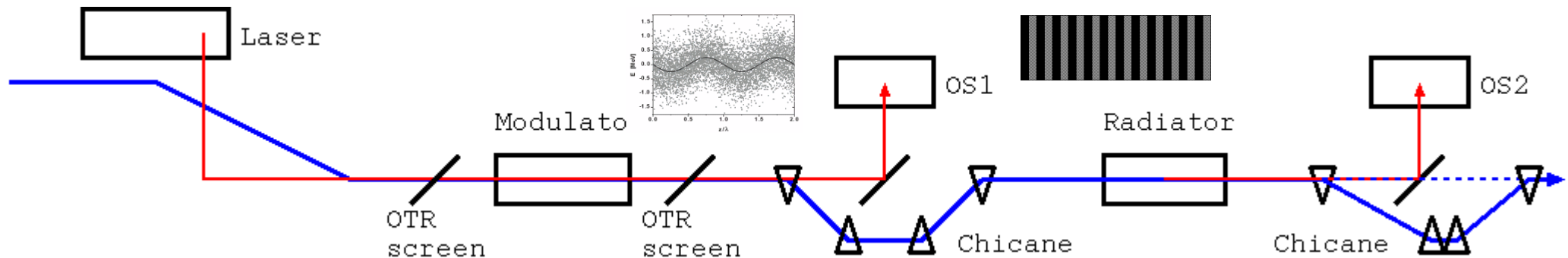
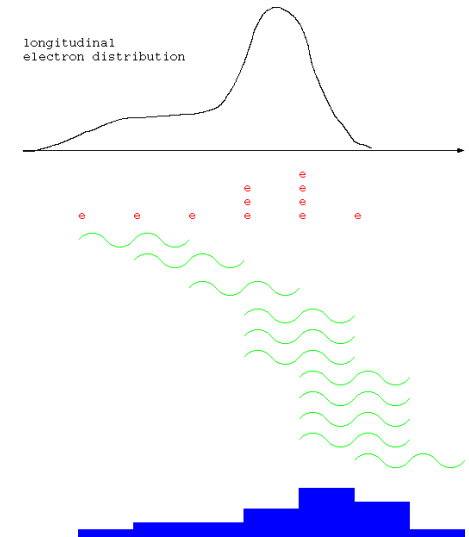
- K. Hacker, S. Khan, TU Dortmund



- P. v d Meulen, P. Salen, Uni Stockholm



- A. Azima, H. Schlarb, DESY

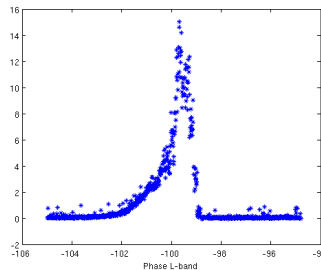


- Single-shot longitudinal bunch profile diagnostics
- Small effect of emittance, slice energy-spread

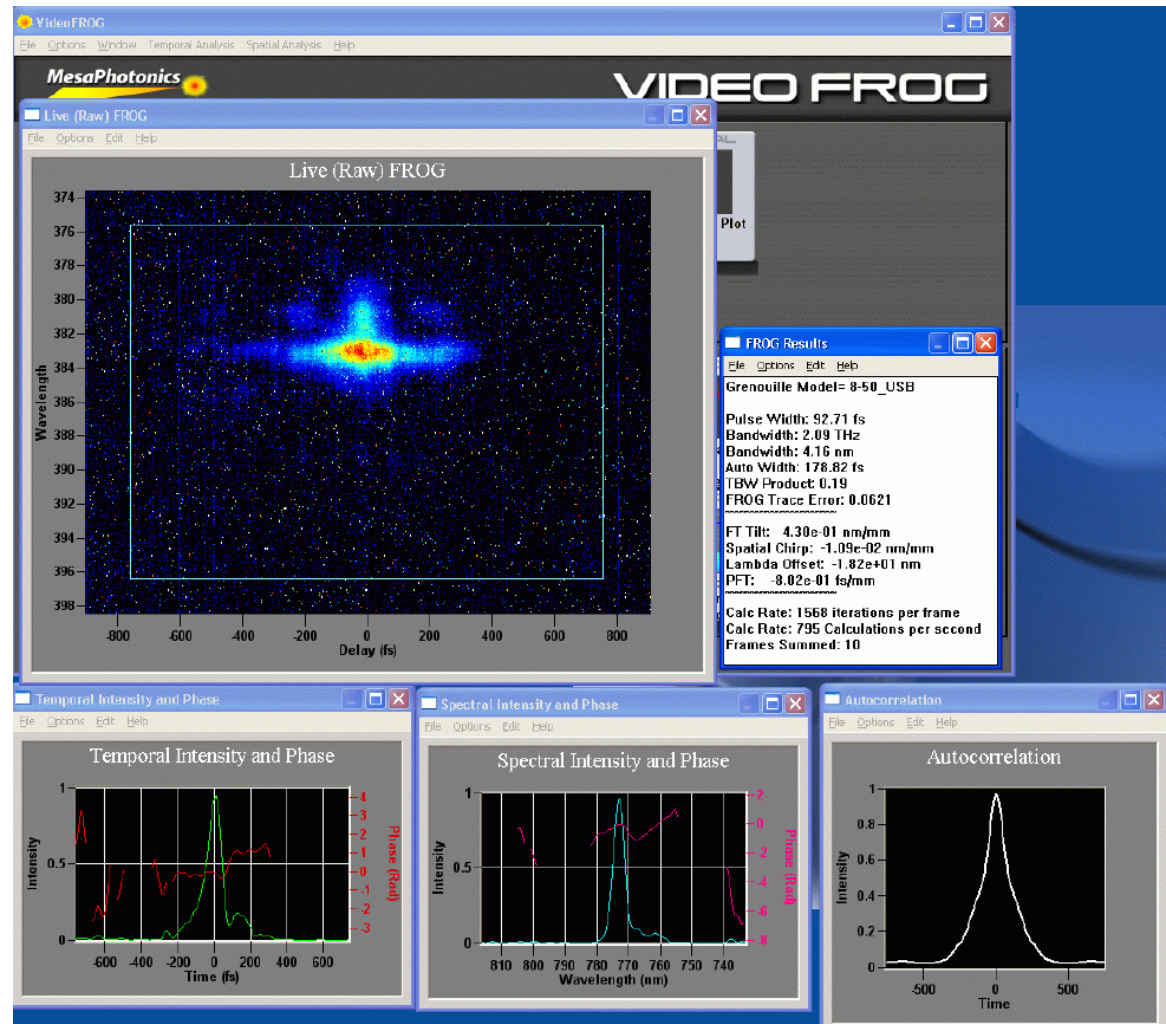
The first incarnation of ORS

- Successful first commissioning 2007-2009

- 3D overlap ok

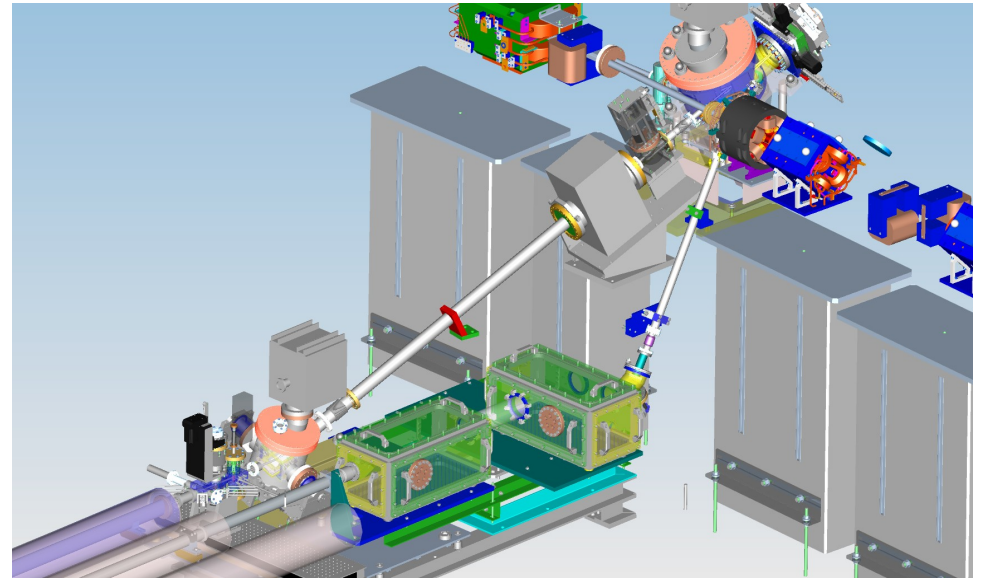


- limited laser power
- needed dedicated shifts due to laser safety
- ORS || SASE tested
- Need experience with operation and stability or repeatability (TIME)



The best of all (new) worlds

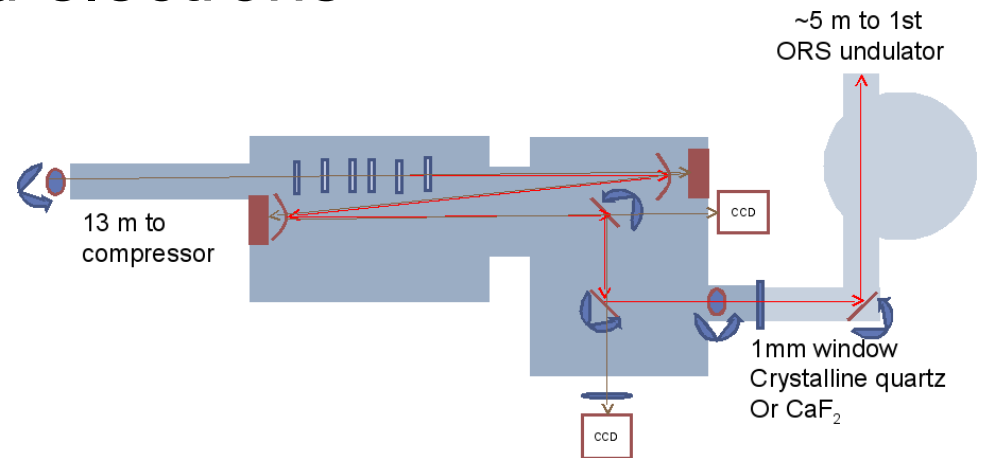
- The optical replica components (undulators, chicanes, tables) were integrated in sFLASH.
- Can use the HHG laser (800 nm, 30mJ).
- Synchronization now much better than 2008 (25fs $\rightarrow$ 10 fs 2013).
- Could use the new laser transport line...
- ...but would still require dedicated shifts, because powerful 800 nm laser in the pipe and laser safety issues $\rightarrow$ no parasitic operation possible



$\rightarrow$ SO CLOSE, AND YET SO FAR

Parasitic Experience Gathering

- Idea, shared with EEHG, is to use 270 nm
 - alleviates laser safety (see Kirsten's talk)
- Tripler (800 nm → 270 nm) and new laser beam line to co-propagate 270 nm and electrons
 - parasitic operation possible
 - less susceptible to μ -bunching COTR
- But...
 - 270 nm laser pulse is very short (100 fs FWHM)
 - requires development of FROG at 270 nm



Single-shot TG FROG for the characterization of ultrashort DUV pulses

Tamas Nagy* and Peter Simon
Laser-Laboratorium Göttingen e.V., Hans-Adolf-Krebs-Weg 1, 37077 Göttingen, Germany
*tamas.nagy@llg-e.v.de

11 May 2009 / Vol. 17, No. 10 / OPTICS EXPRESS 8144



Request

- Dedicated setup time is the same as for EEHG and HGHG (see next talk by Kirsten Hacker)
 - Develop initial overlap routine and calibrate diagnostics
- Integrate ORS/EEHG/HGHG setup with non-zero settings for undulators and chicanes into normal operation routine
- Permit injection of 270 nm laser during normal user operation to affect one bunch in a train
- Permit ***brief*** insertions of screens to verify overlap

