

Tango Meeting

DESY Status Report

Thorsten Kracht
Grenoble, 13. May 2009

PETRA III



Energy: 6 GeV

Photon Energy: 200 eV – 400 keV

Brilliance: $\sim 10^{21}$

Emittance: 1 nmrاد

Beamlines: 14 (incl. EMBL and GKSS)

Instruments: 30

PETRA III



PETRA III







public transport

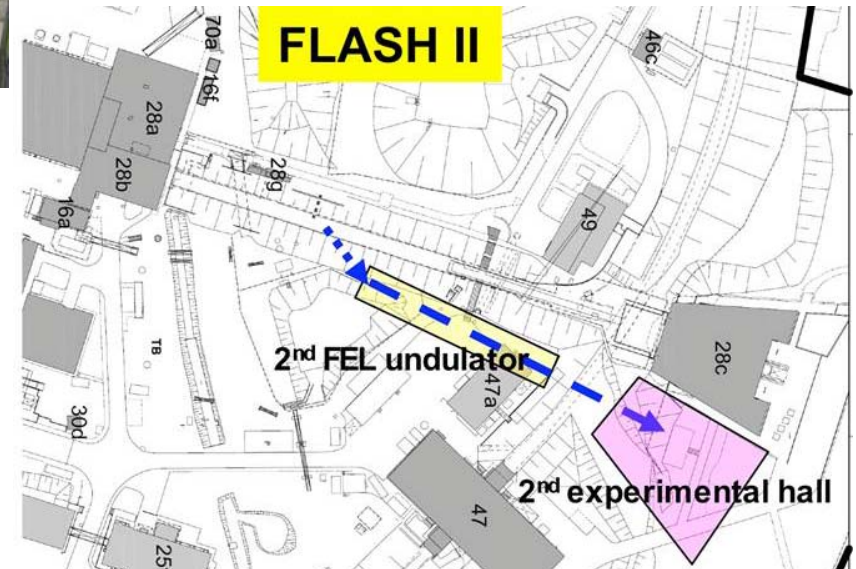


- > 16. April 2009 first stored beam
- > 30. April 2009 first beam in an optical hutch
- > First friendly users: Q4'2009
- > User operation: 2010

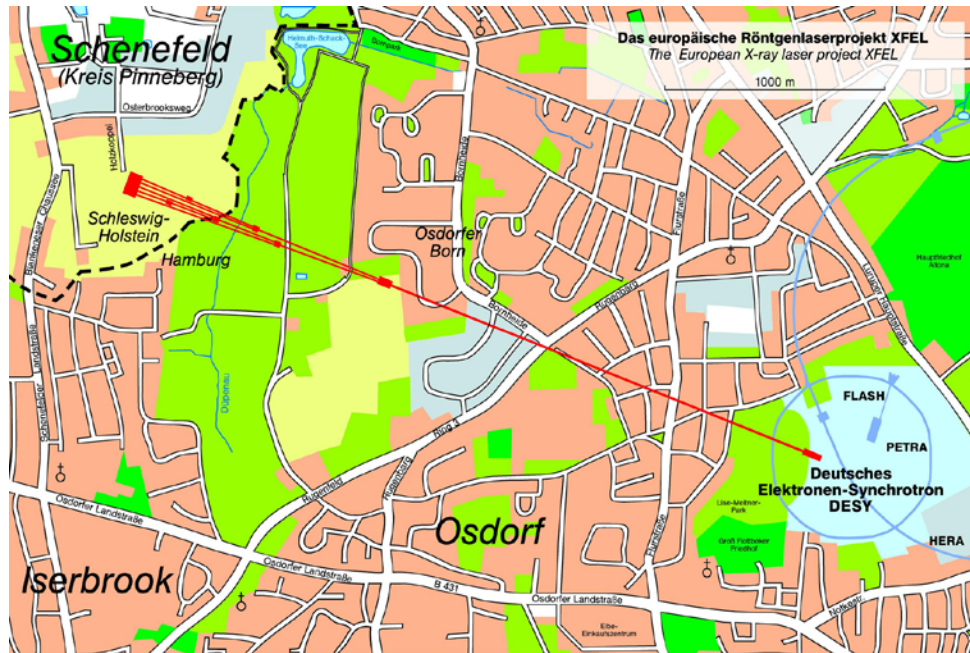
FLASH



- > 5 beamlines, 31 instruments
- > Energy 1.2 GeV
- > FLASH II proposed
 - Collaboration with HZB
 - Seeding
 - Doubling user capacity



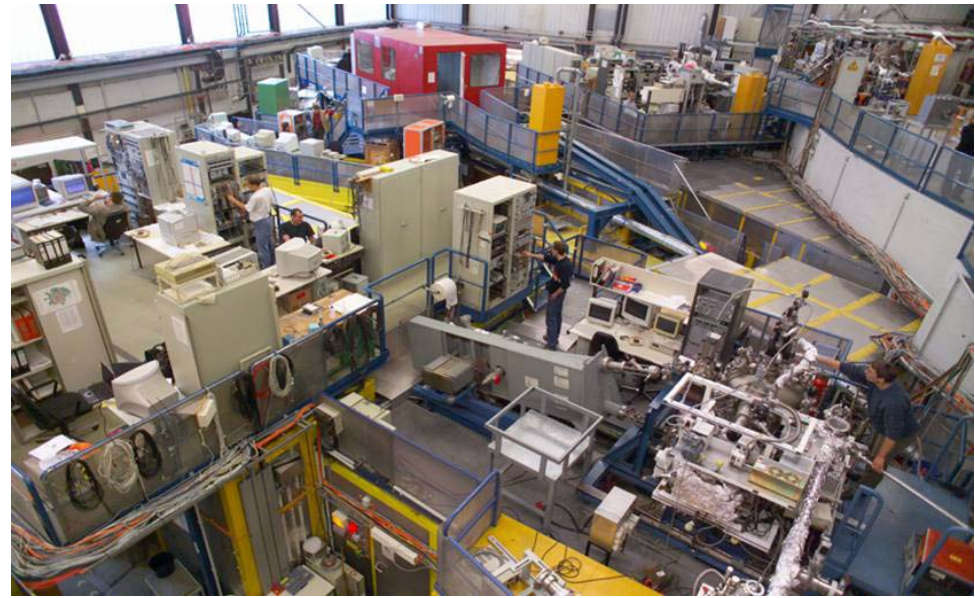
European XFEL



- > Phase 1: 5 beamlines, 10 instr.
- > Energy: 10 – 17.5 GeV
- > Photon energy: 0.2 - < 12.4 keV
- > Pulse length < 100 fs



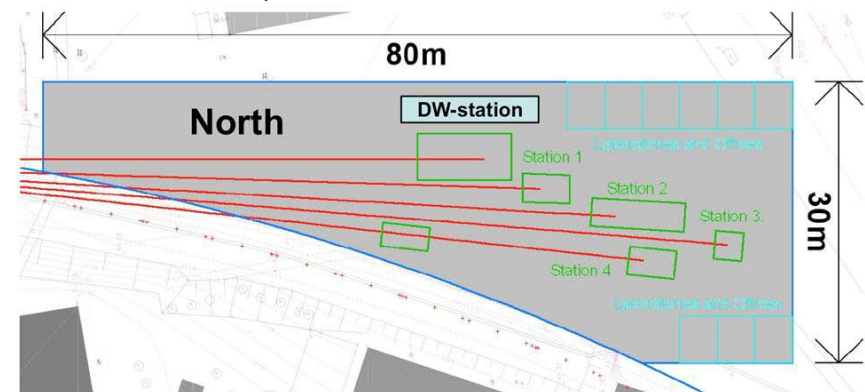
DORIS III



- > 33 beamlines, 44 instruments
- > Energy: 4.4 GeV
- > Photon energy: 3 eV – 250 keV
- > Emittance: 410 nmrاد
- > Max. brilliance: 10^{15}
- > Close down: 2012/2013
- > Transfer selected techniques to PETRA III

PETRA III extension:

1. Phase: 4 ID, 8 BM stations



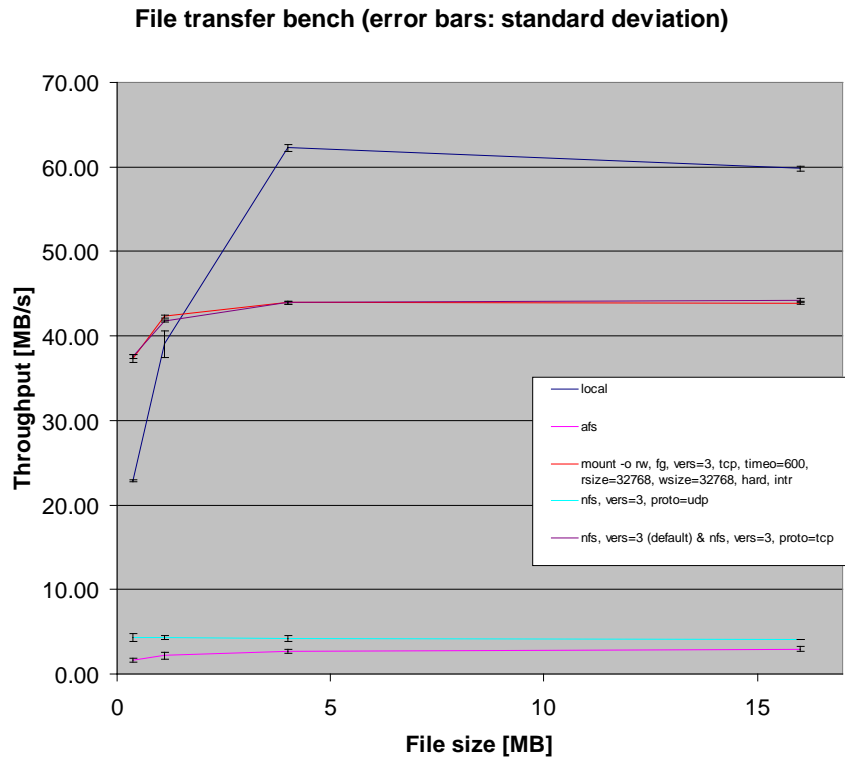
Current activities

- > Experiment control computing
 - Teresa Núñez: Sardana, Spock, Scan Server, Diffractometer, hkl library
 - Jens Meyer: jddd
- > Installation of beamline PCs
 - Petra hall, workshops: 10 PCs
 - VME, OMS MAXV, ZMX
- > DOOR: User administration
 - Beamtime accounts
- > Radiation interlock
 - Web based application
 - New authentication/authorization scheme
- > Data storage & processing
 - Use central IT infrastructure
- > Tango server production



Data storage

- Local storage: 60 MB/s (Standard PC)
- Afs: 1.5 – 3 MB/s
- Central file server, NFS: 37 – 44 MB/s
 - ~ 700 TB in 200 days
- Further tests
 - Multiple client access
 - WGS I/O speed
 - WGS computing power
 - Online analysis
 - Reconstruction
- Options
 - Multiple RAID arrays
 - 10 GBit connections



(A. Rothkirch, H. Blume, M. Gasthuber, P. v. d. Reest)



High Data Rate Processing and Analysis Initiative:

A proposal to develop and implement a common framework for

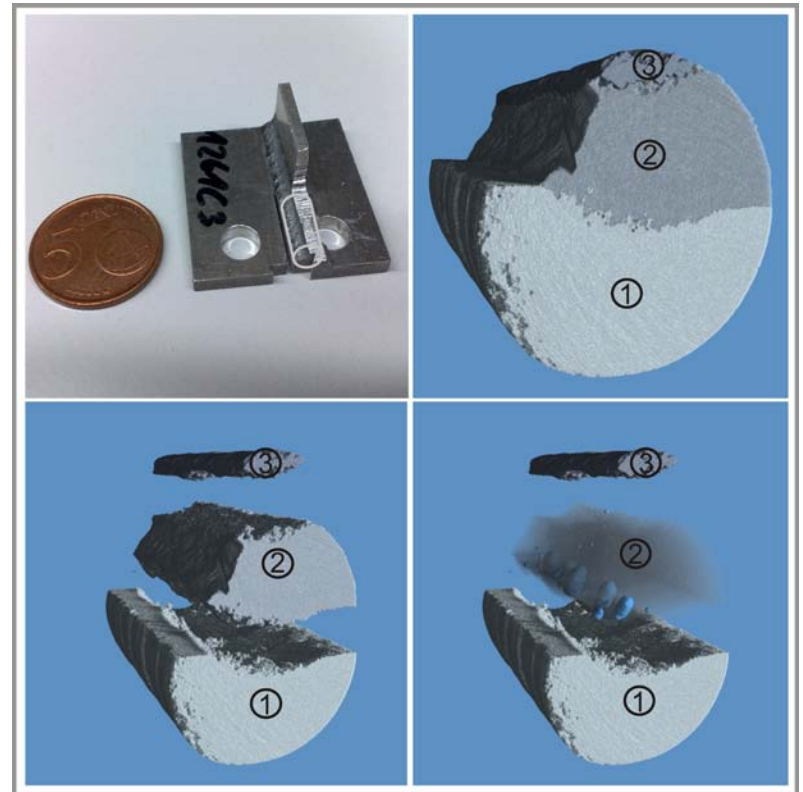
- Data acquisition and reduction
- Online data evaluation
- Simulation, modeling
- Analysis
- Visualization
- Data management

as a collaborative effort of the PNI centers.



Tomography

- Common to photon and neutron sources
- Data rate: 500 TB/year (> 2010)
- Online data evaluation
 - Monitoring
 - Quality of the sample
 - Parameter adjustment, statistics
- Reconstruction
 - Parallel computing
 - Offline: high quality reconstruction
- Data management
 - Remote access
 - Standard data format
 - Including description



Laser-beam welding in civil aircraft production
(6 mm diameter, 40 keV, HARWI II)

Data Management



- File servers, archive
 - PNI centers provide resources
 - Data lifetime policy
 - Accounting
- Common access method
 - Option: Web-based
- Common authentication scheme



Compute Servers

Analysis, modeling, simulation, fitting



Online and offline

- Interactive
- Batch operation
- Fast data access
- Parallel computing

Computing Initiative

- Parallel computing systems
 - MPI (message passing interface)
 - OpenCL: CPU, GPUs (graphics processing unit)

The Computing Initiative

- WP-1: Data management
- WP-2: Parallel computing
- WP-3: Data processing, reduction
- WP-4: Visualization
- WP-i: Applications
 - Candidates: Tomography, SAX, Diffraction, TOF Spectroscopy, X-Ray Micro/Nano Probe, Coherent X-Ray Diffraction
 - 2012: First releases
 - 2012 – 2014: Extend applications

Open source project

Status: proposed



Thanks for your attention

