FEL Photon Beamline Concept

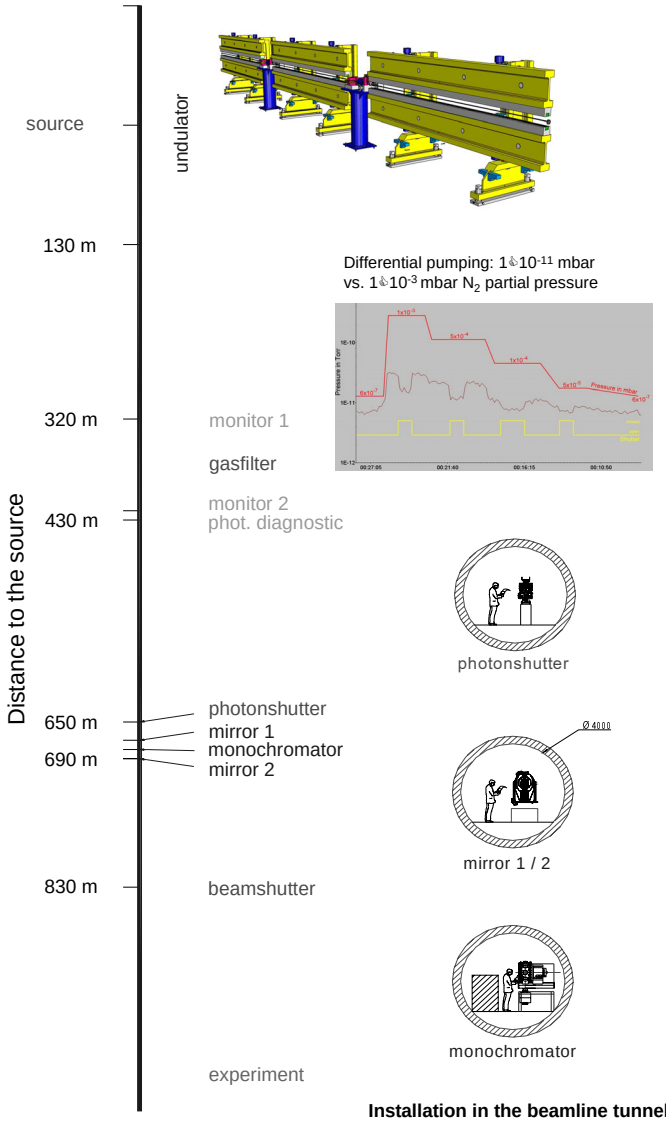
Generic Beamline

Main tasks:

- Beam shaping, collimation, beam stop
- Filtering, beam position monitoring
- Photon diagnostic
- Monochromatisation
- Focusing
- Hydrocarbon - and dust - free vacuum system
- Personal safety
- Equipment protection

Length of the beamline defined by:

- Reduction of power density
- Demagnification ratio



Installation in the beamline tunnel

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Vacuum System

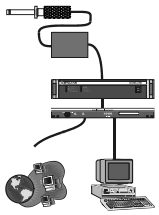
Dust Free

Class 10000/100 clean room with cleaning facility for preparing all VUV-FEL components particle and hydrocarbon free

(a) ultrasonic bath in class 10000 area; (b) rinsing bath, (c) dryer, (d) assembly in class 100 area

Hydrocarbon Free

Automatic in situ test for hydrocarbon contamination of the vacuum system

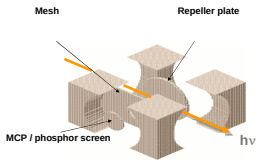


Quadrupol mass-spectrometer system for residual gas analysis

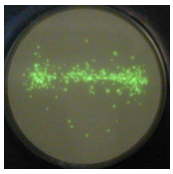
Beam Position and Intensity

Development based on residual gas ionisation using the differential pumping scheme of the gas filter for the VUV-FEL and XFEL

- non intrusive measurement
- gas intensity monitor: VUV-FEL
- gas position monitor: first tests, to be continued at PETRA-II and VUV-FEL



Detector scheme

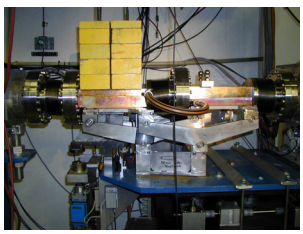


trace on phosphor screen

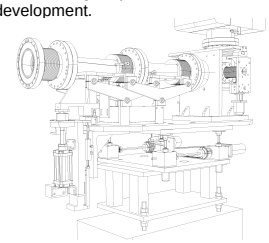
Beamline Components

Photon - shutter - slit systems for XFEL

Based on improved PETRA-II designs, systems suitable for higher power densities and higher demands on beam quality (coherence) are under development.

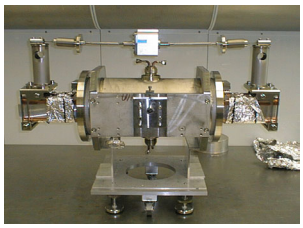


First new primary slit system installed at W2-beamline



U. Hahn, M. Rüter
„Hochleistungsstrahlverschluss- und Spaltsystem für Synchrotronstrahlung", Patent Nr. DE 101 35 307 C2

High heat load mirror chambers



Pneumatically driven **mirror bender** with cooled **mirror (1m)** for white beam applications

New designs will satisfy the higher demands on precision and beam stability