X-ray Beamline Optics and Photon Diagnostics

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Vacuum Team: Martin Dommach (WP73)
Diagnostics: Jan Grüner (WP74)
Contents

- Preparation activities in Hera South & tunnel installation progress in 2014
- Mirrors & Metrology in Petra III Lab
SASE1 Photon Beamline
Preparation at Hera South Lab
Arrivals at Hera South

- 3 x Entrance Slits (SRA)
- Pop-in Monitors (WP74)
- MCP detectors (WP74)
- 8 Photon Shutters (Frontends)
December 2013: Test Installation
26. May 2014: Tunnel Installation Starts!

Most pictures by Nicole Kohlstrunk
The early phase: May – August 2014
Problem: Humidity
Dehumidifier installed by MKK in August

from Sabine Cunis
Grouting base plate of mirrors with epoxy
Grouting of diagnostic supports in XTD2

Steel support pillars for 2D-Imager-SR

Support for XGM

2D-Imager-FEL and Pop-In-Type II-45

Harald Sinn, European XFEL

Slide from Jan Grünert
November: Tunnel cleaning in XTD2 to prepare for vacuum installation
First component installed on Nov 28

Dec 2014:
Start UHV beam transport installation
Next items to be installed

PES

XGM

DESY/WP74
Test of Petra III P04-PES at LCLS

Tomorrow 14:00-18:30, building 61
Workshop on Photon Beam Diagnostic
(talks from Jens Buck on PES and Kai Tiedtke on XGM)
X-ray mirrors: Profile error specification

- Human Hair > 20 μm
- Super-polished mirror: \( R > 6300 \text{ km} \)
Prototype bimorph XFEL mirror (2013)

Traditional polishing
+ 1 IBF step (0.3 μrad rms)
Contract on super-polishing of 10 mirrors (1 m long) with JTEC

Ueda-san, 9.10.14

2 pre-polished mirrors shipped in Nov 2014
Metrology Lab in Petra III: 30 cm diameter Fizeau Interferometer delivered in November 2014
Current work at Metrology Lab:

- Commissioning and reference measurements
- Test of bimorph technology & mechanical bender
- Influence of mounting
2015:
- XTD2: Finish vacuum installation install E-racks
- XTD9: Drill holes, orbital welding, installation
- XTD10: Start of installation
- Receive first super polished mirrors

2016
- Installation SASE2 (XTD1 & XTD6)
- Close tunnels
Thank you for your attention!