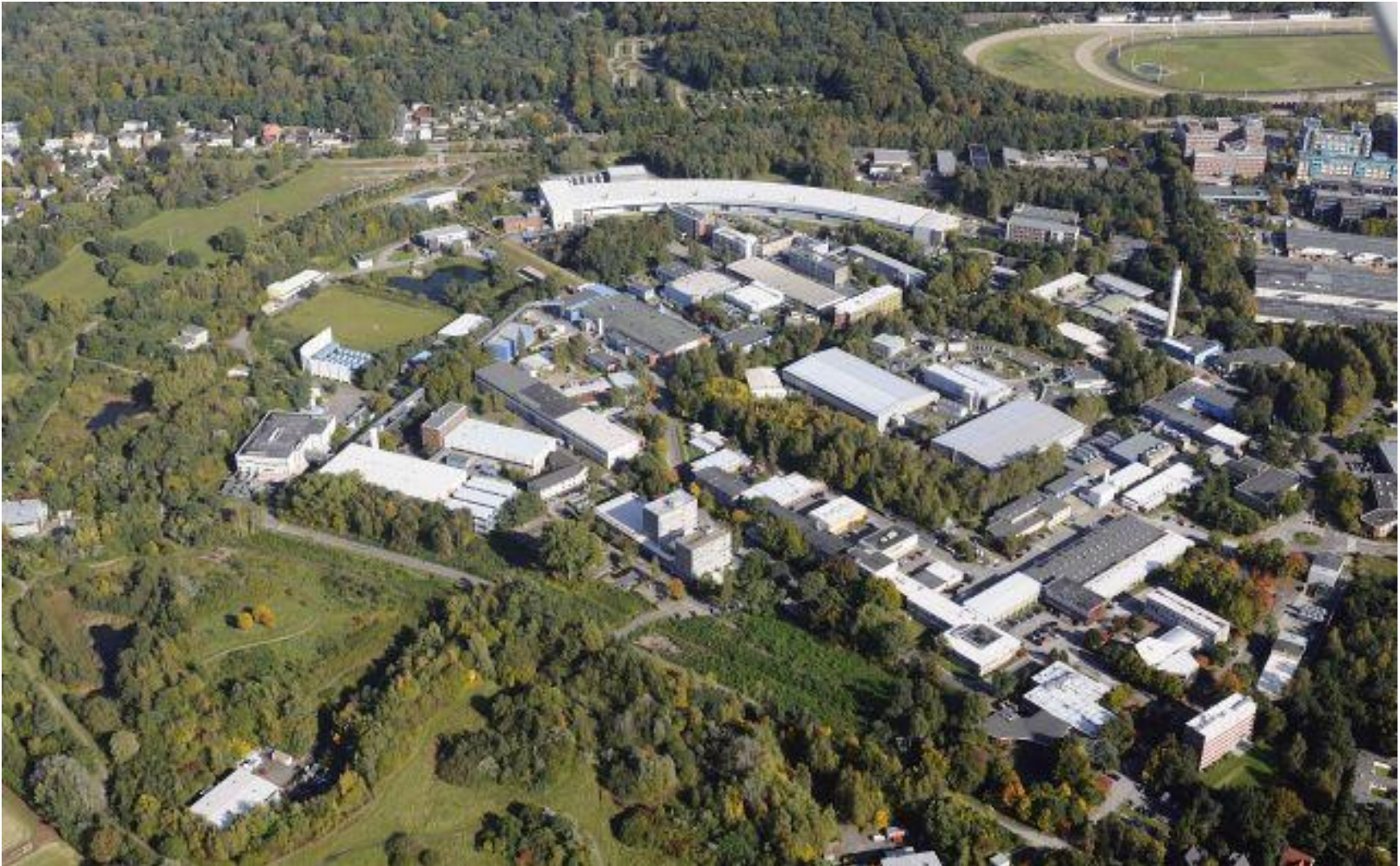


Radiation Protection at the PETRA III Photon Beamlines

J. Knabe, S. Lessmann-Bassen, A. Wefer, T. Wroblewski
DESY, Hamburg, Germany



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DESY, Hamburg, Germany

The PETRA III Project:

- The Source
- Front End
- Optics Hutches
- Experiment Hutches
- In between
- Measurements and Monitoring

The experimental hall



**Machine
parameters:**

6 GeV, 100 (200) mA

Top-up

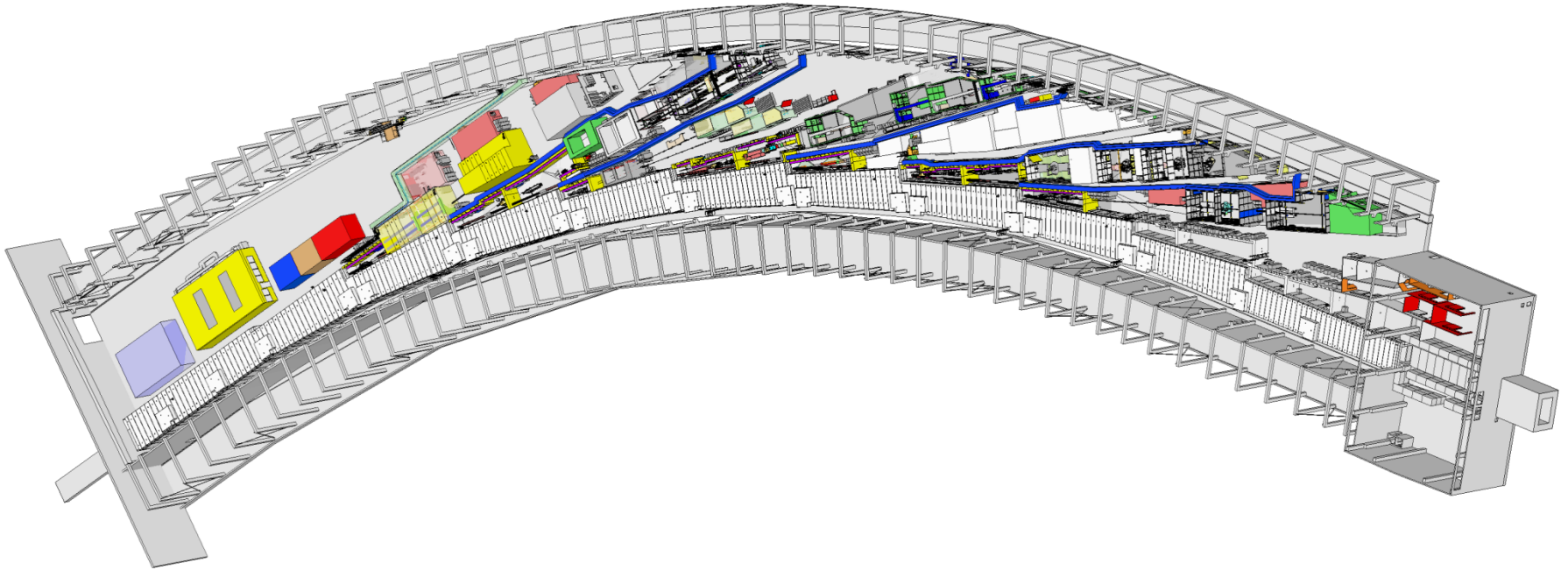
2.304 m

**1 Octant,
9 Sectors (<5°)**

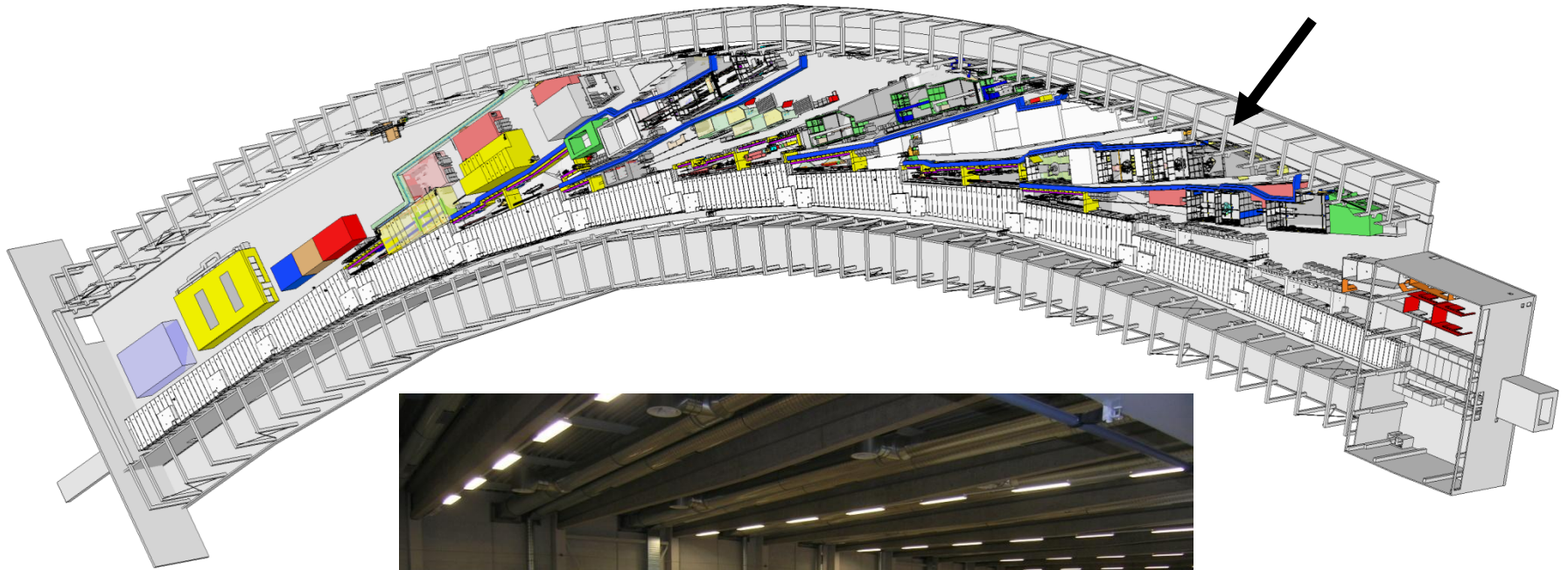
**14 Undulators
(5*2 2m, {5 mrad}
3 5m,
1 10m)**



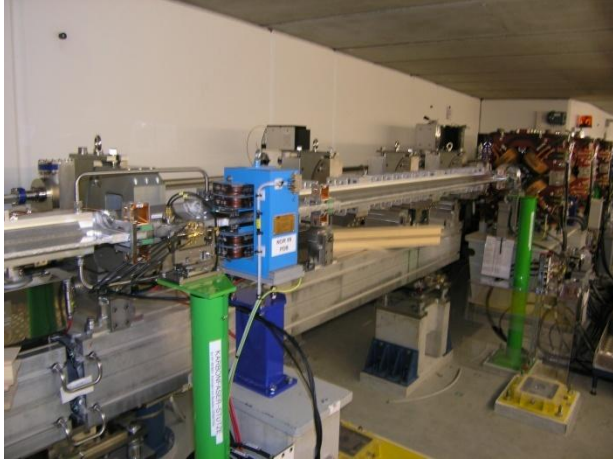
270.85 * 25.7 m²



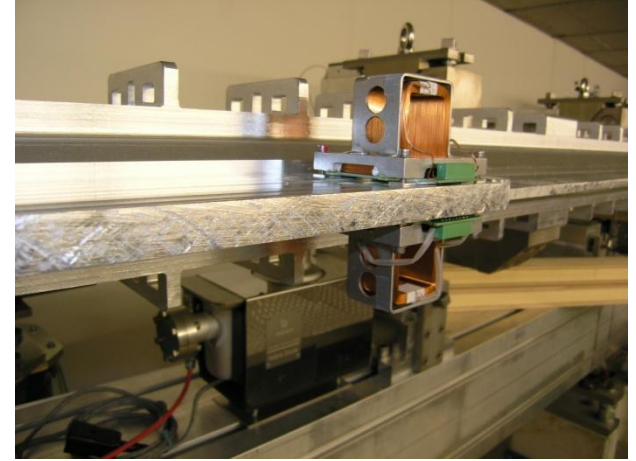
Then and now



PETRA III Photon Beamlines

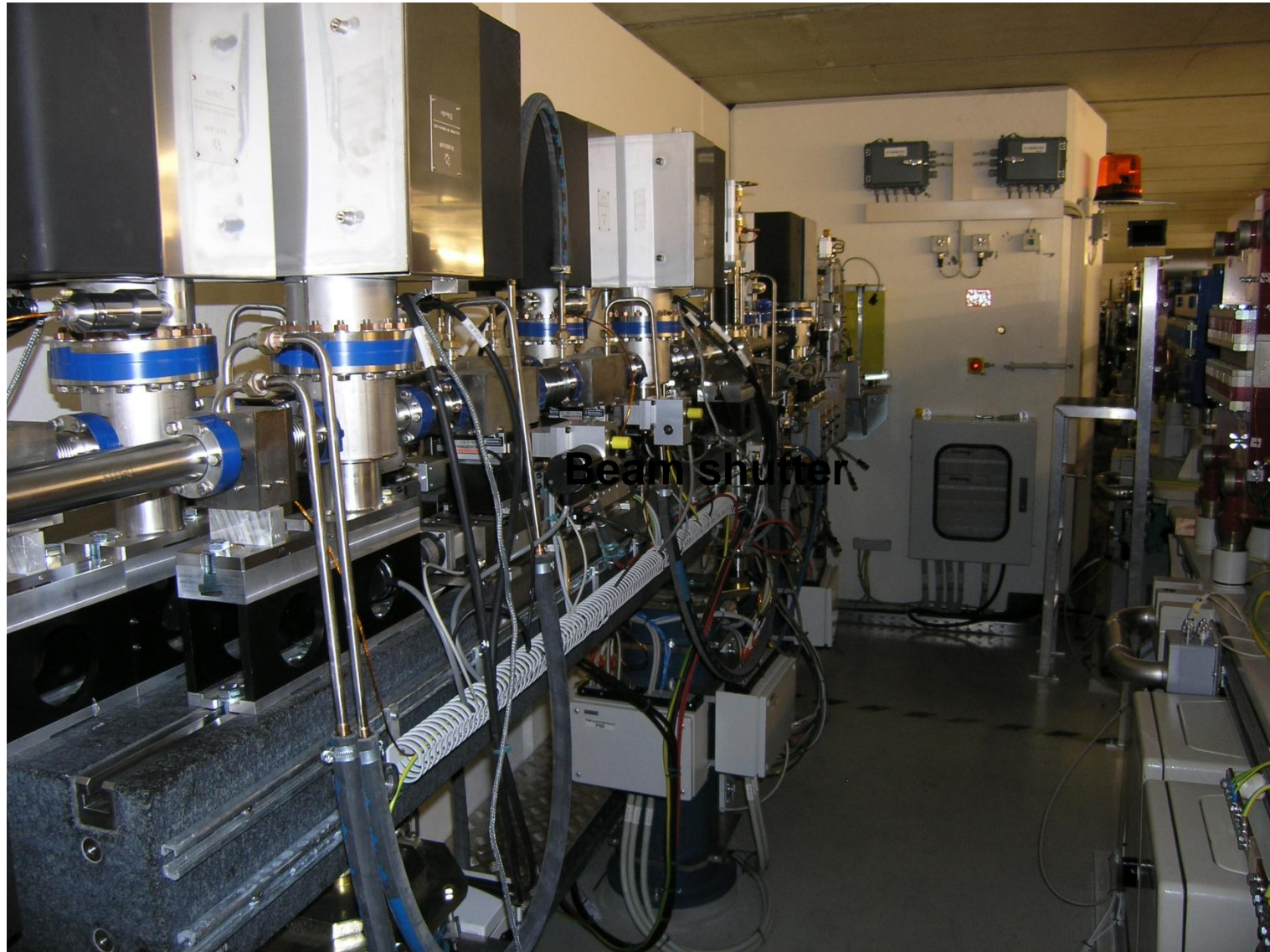


Vacuum chambers

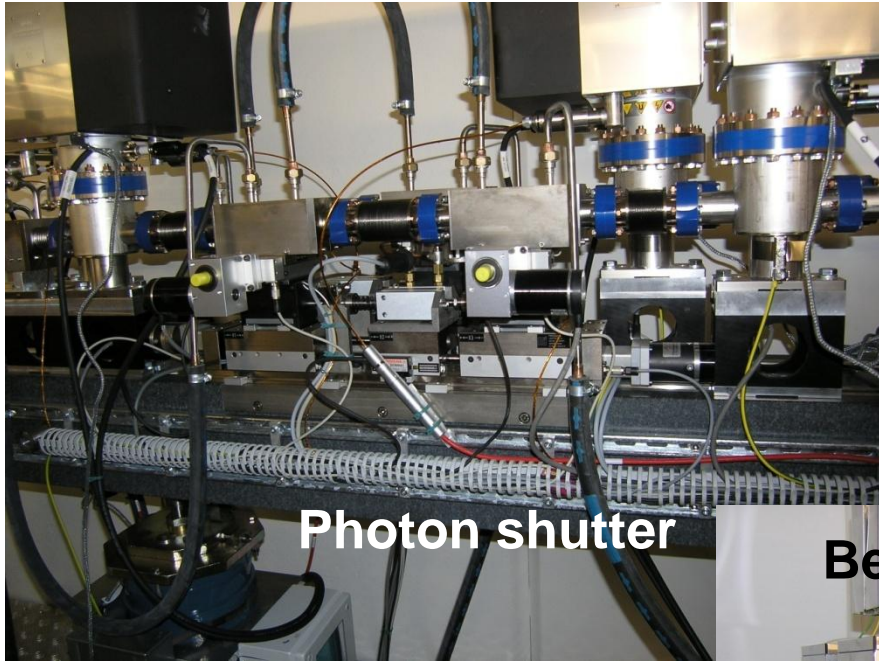


Insertion device

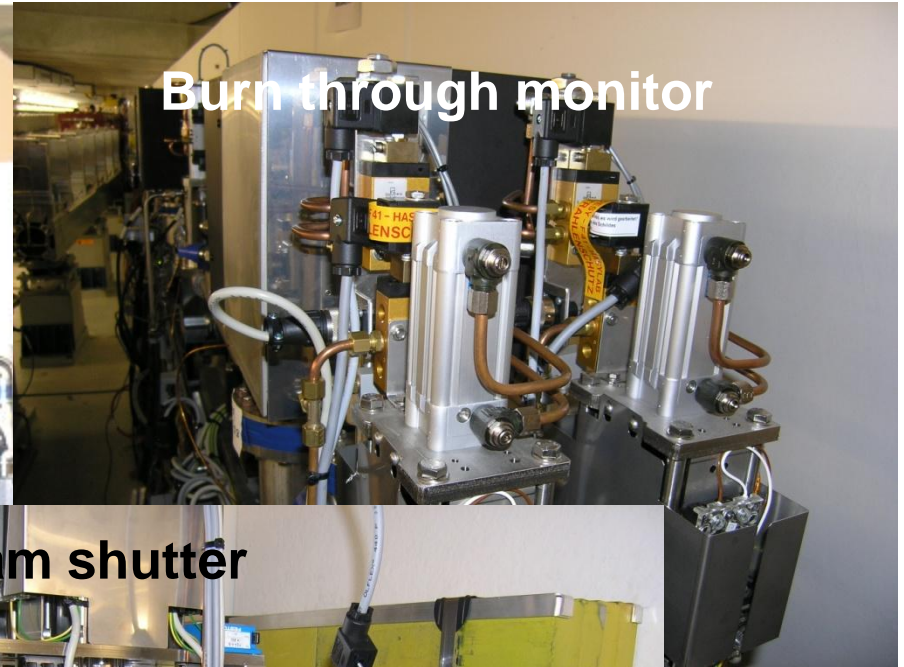




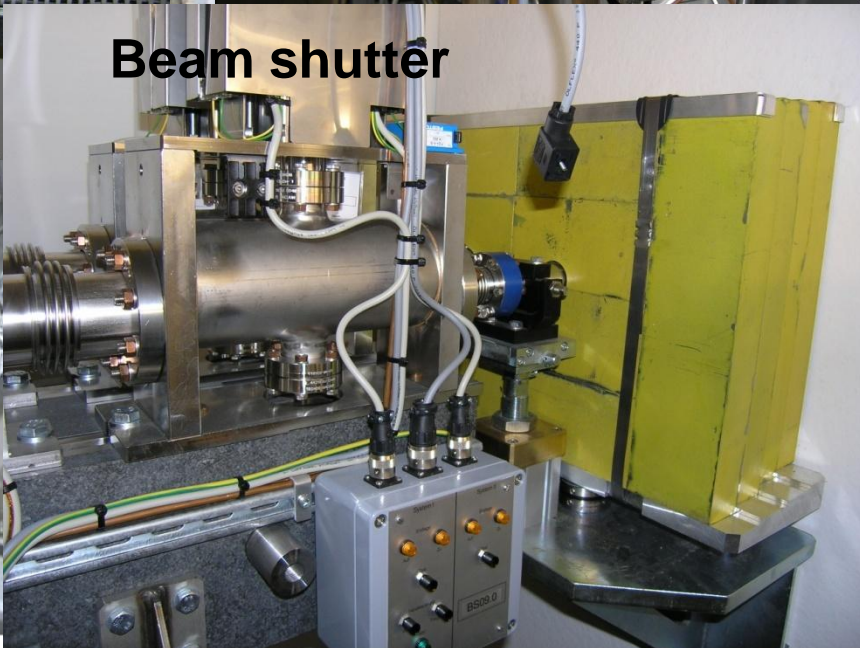
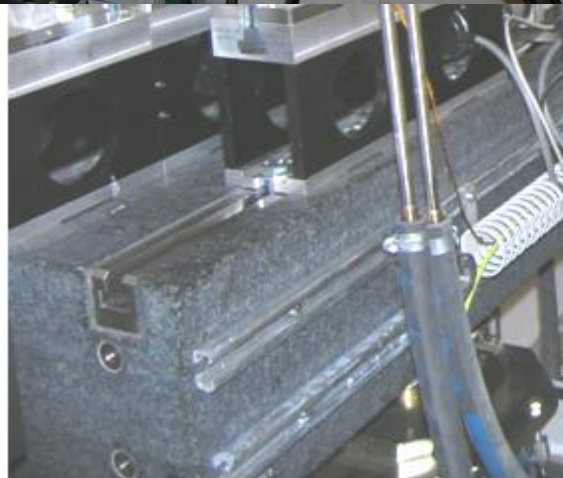
Slits and shutters



Photon shutter



Burn through monitor



Beam shutter



**Heavy concrete
(Baryte)
Sides & roof 30 cm
Back 50 cm**





**~ 15 l liq. N₂ in
secondary circuit**

**→ at least 16% O₂
In case of sudden
release in smallest
hutch**

**Nevertheless,
operation only
after search
(Interlock)**

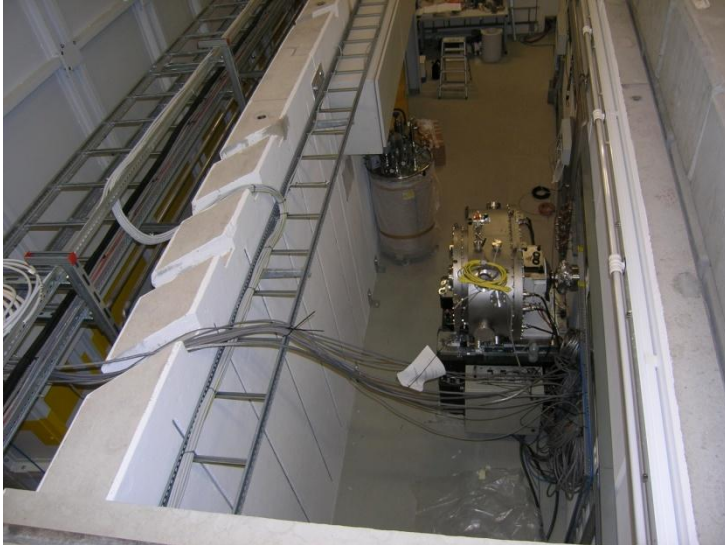


**~ 15 l liq. N₂ in
secondary circuit**

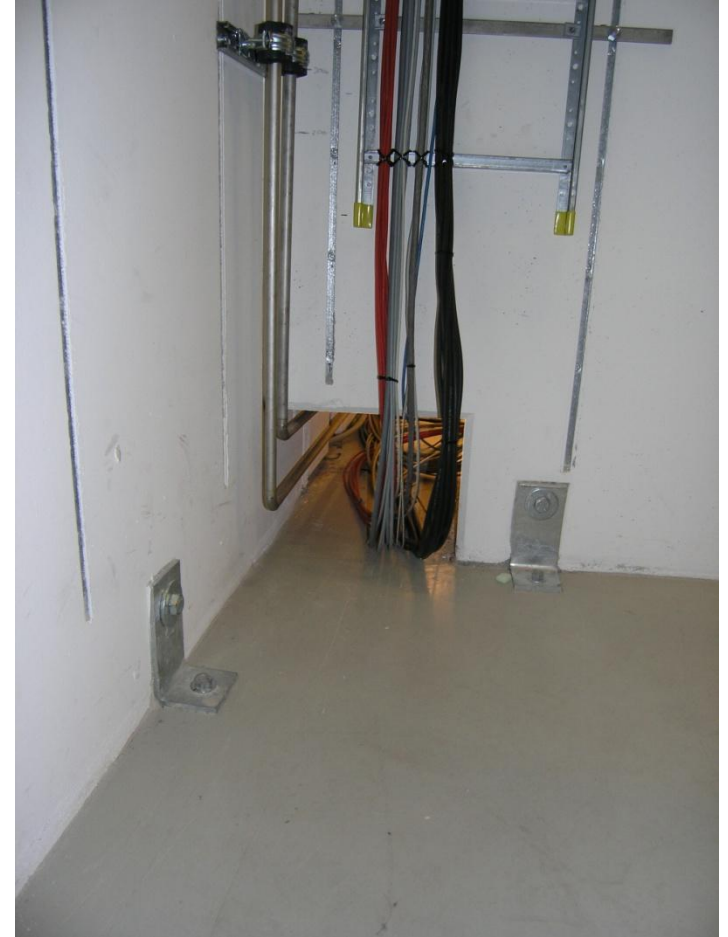
**→ at least 16% O₂
In case of sudden
release in smallest
hutch**

**Nevertheless,
operation only
after search
(Interlock)**

Stiff tubes



**Media
for
optics**



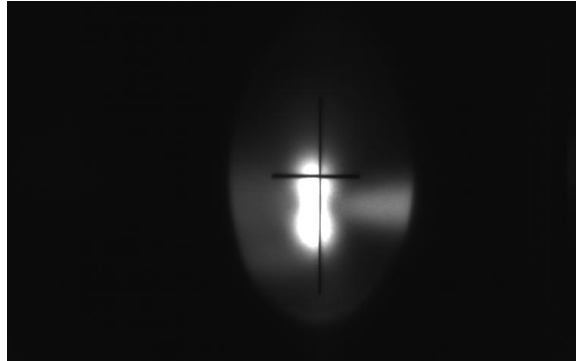
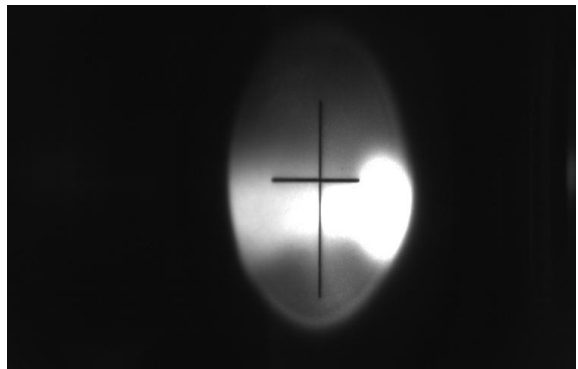
and front end



First beam







1 W

2 W

Feedthroughs



BL	Length [m]	period length [mm]	magnet. Field [T]	E_{Max} [keV]	Bandwidth	side wall [mm]	Backwall [mm]		beamstop 30cmx30cm [mm]
							>115cm	<115cm	
P01	20	32	0.91	40					
P02	2	22	0.8	60					
P03	2	29	0.81	25	1%	6.5	7	7	20
P04	5	65.6	1.1	3					
P05	2	29	0.81	50	1%	10	11	11	20
P06	2	31.4	0.91	120	1%	16	30	45	80
P07	4	19	0.7	300	1%	10	20	30	60
P08	2	29	0.81	30	0.01%	5	11	11	30
P09	2	31.4	0.91	50	0.01%	5	11	11	30
P10	5	29	0.81	25	1%	7	6	7	20
P11	2	31.4	0.91	25	0.01%	4.5	5	5	20
P12	2	29	0.81	20	1%	3.5	3.5	3.5	20
P13	2	29	0.81	35	1%	14	18	18	30
P14	2	29	0.81	35	1%	14	18	18	30

Based on calculations by Y. Asano



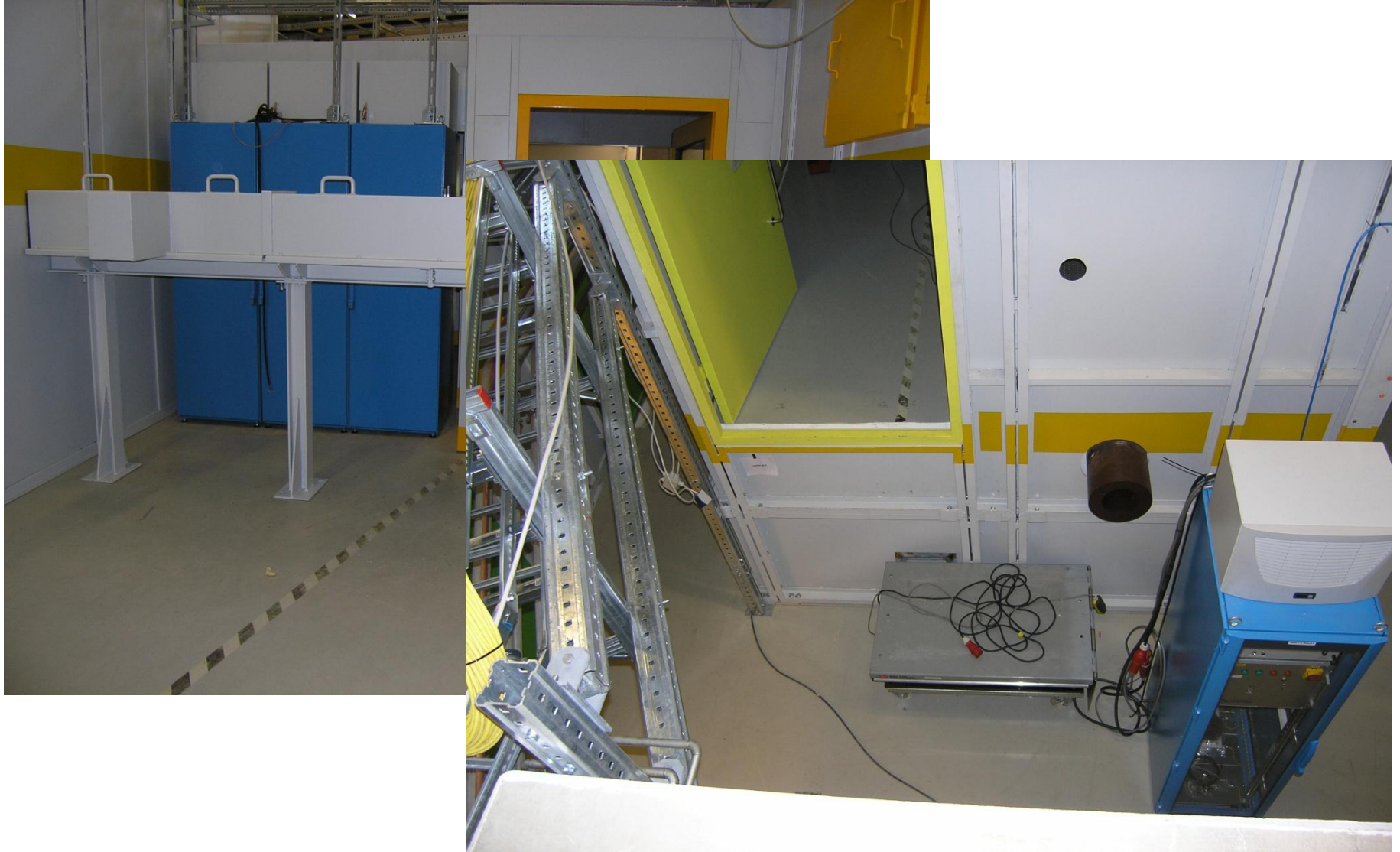
Experimental hutches







Beam tubes









PETRA III Photon Beamlines

Who can do the measurements ?



Who can do the measurements ?



Radiation monitoring



Active radiation monitors (acting on beamshutters, 35 keV - 1.3 MeV)

Additional passive dosimeters (readout regulary, 15 keV - 9 MeV)

At DORIS during service week

**Start at first beamlines
with high density and frequency**



- **Shut down of PETRA II on 1.7.2007**
- **All optics hutches finished**
- **First beam (~1mA) in optics hutch**
 - Concept of chicane in back wall ok
 - Chicanes in side walls need improvement (sand bags)
- **Experimental hutches for 6 beamlines finished**
 - (Sekt. 2, BL3; Sekt. 4, BL5; Sekt.5, BL7; Sekt.6, BL8+9; Sekt. 7 BL10)
- **Experimental hutches for 4 further beamlines ordered**
- **Shielding for several beam tubes / optics designed / ordered**
- **Comissioning of first monochromator in June**
- **Followed by first experiments**

Thanks to all who have contributed to such a fast comissioning

Thank you for your attention