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Status of Nanofocus @ MINAXS

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Treffen der Norddeutschen Biophysiker, Borstel

Petra III

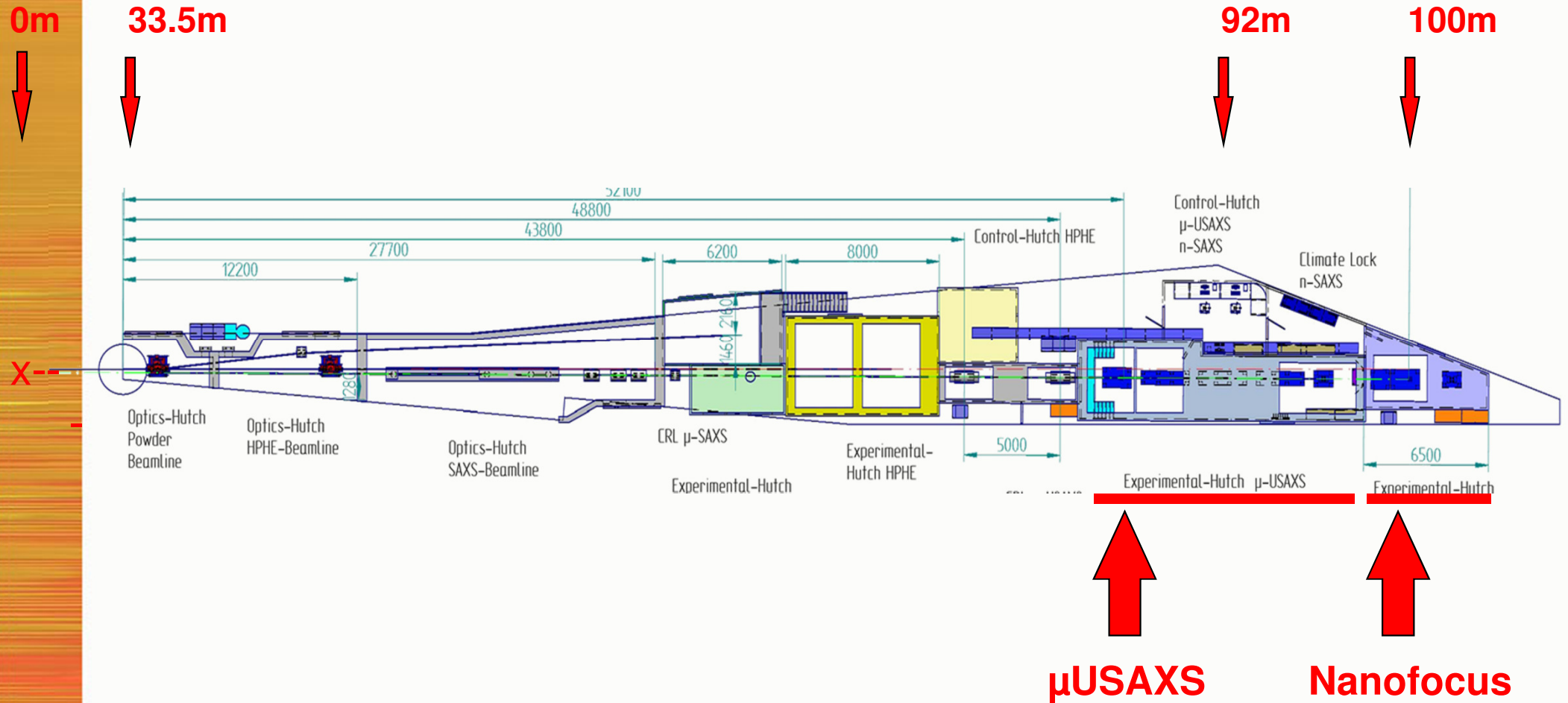


MINAXS Beamline

MIcro & **NA**nofocused **X**-ray **S**cattering



MINAXS Nanofocus Extension

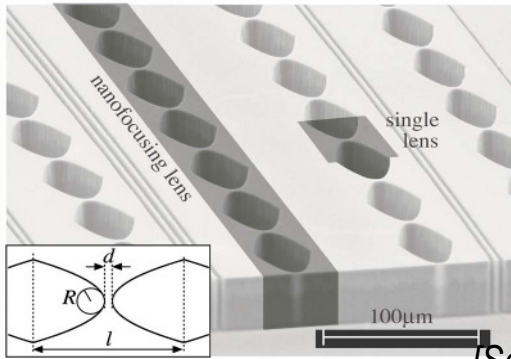


Experimental Hutch

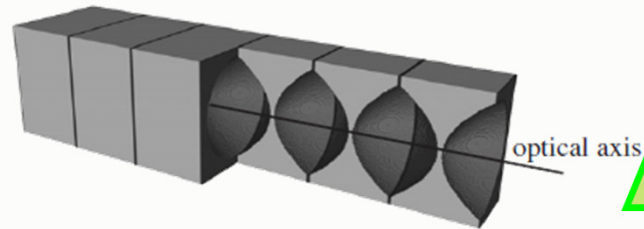


Nanofocusing Optics

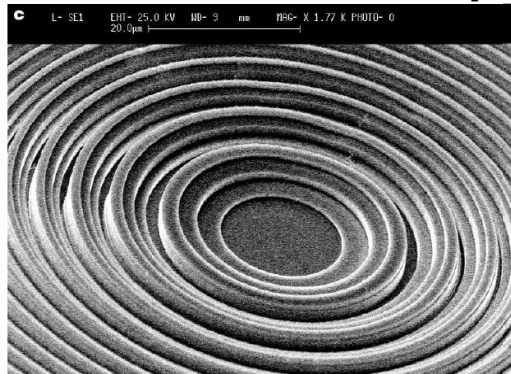
small focus, high coherence



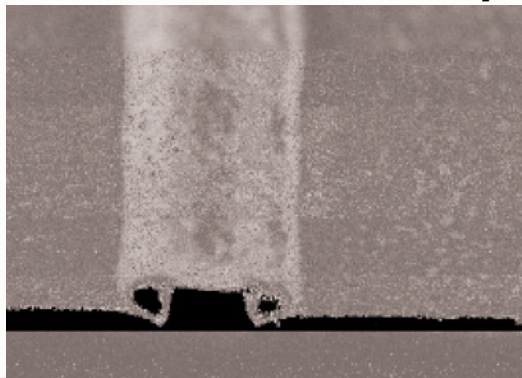
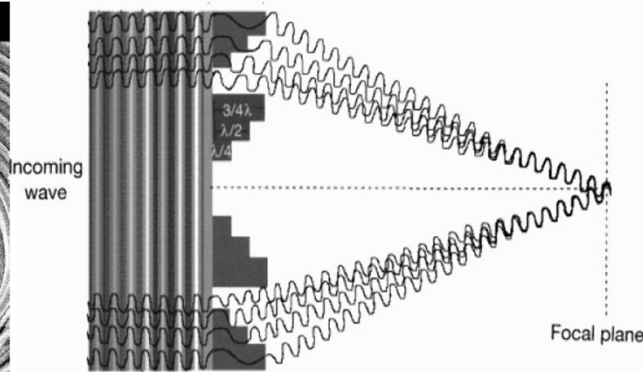
[Schroer]



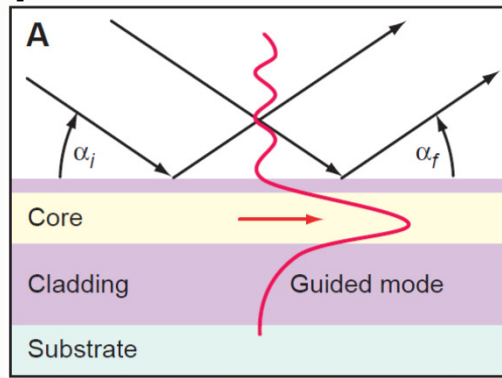
[Lengeler]



[Fabrizio]



[Metzger]



[Pfeiffer]

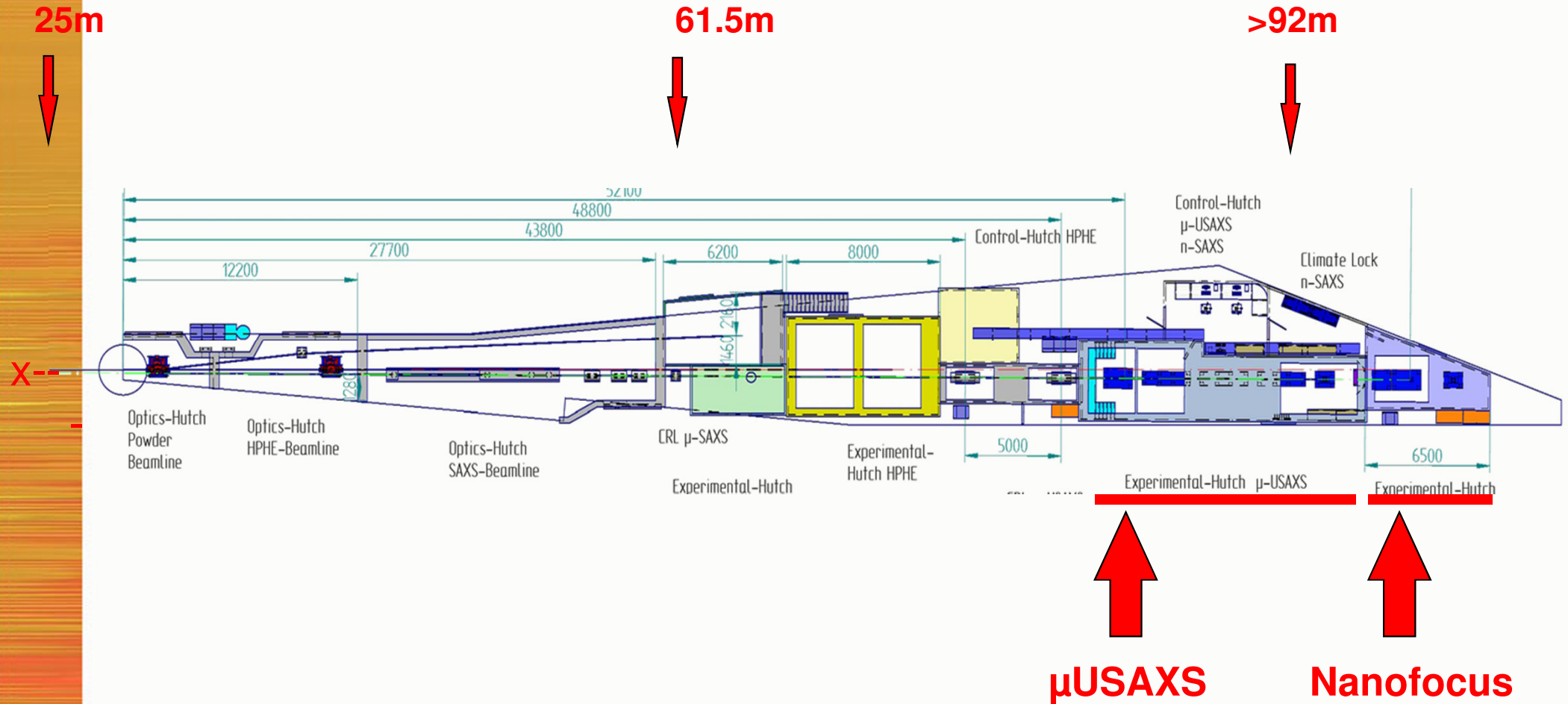
high acceptance and flux

Refractive
Lenses

Fresnel
Lenses

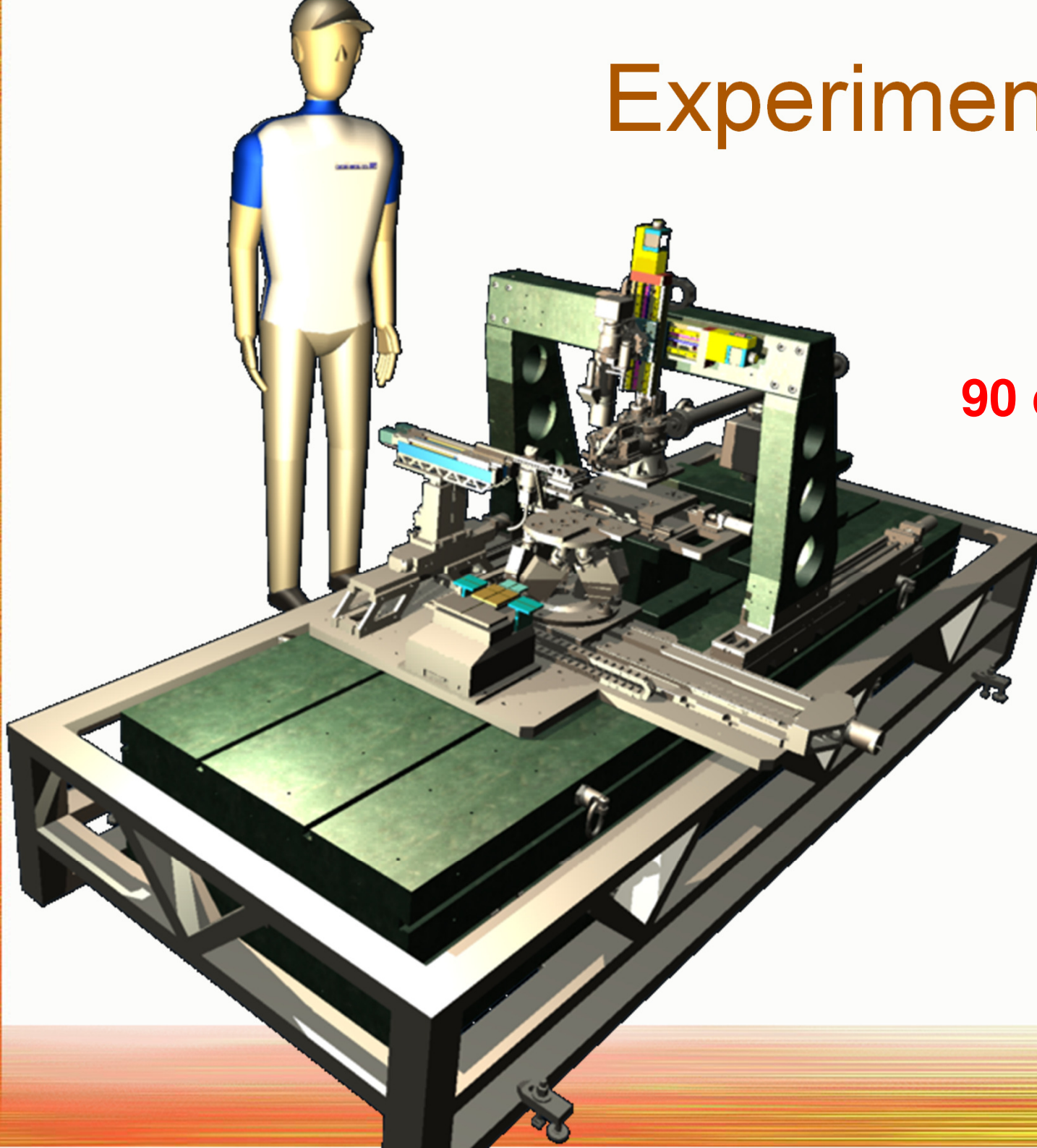
Waveguides

Refractive Lenses Positions



Experimental stage

Beam position:
90 cm above ground



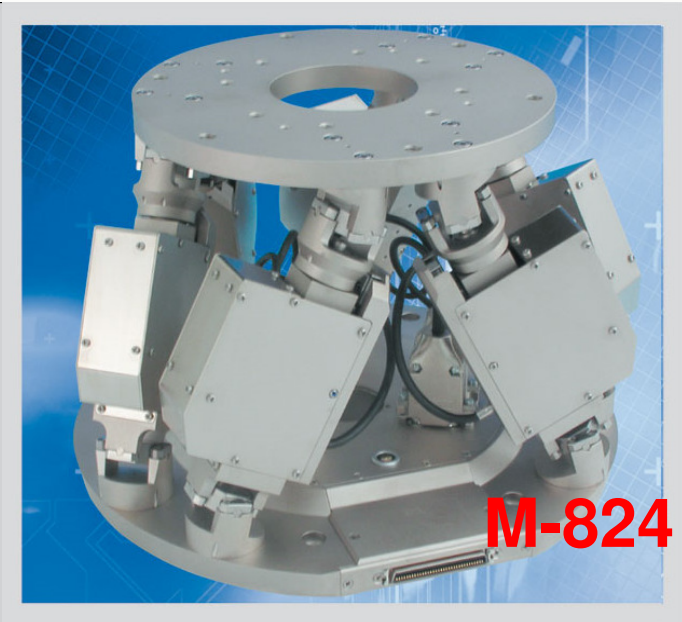
Positioning



P-611xzs



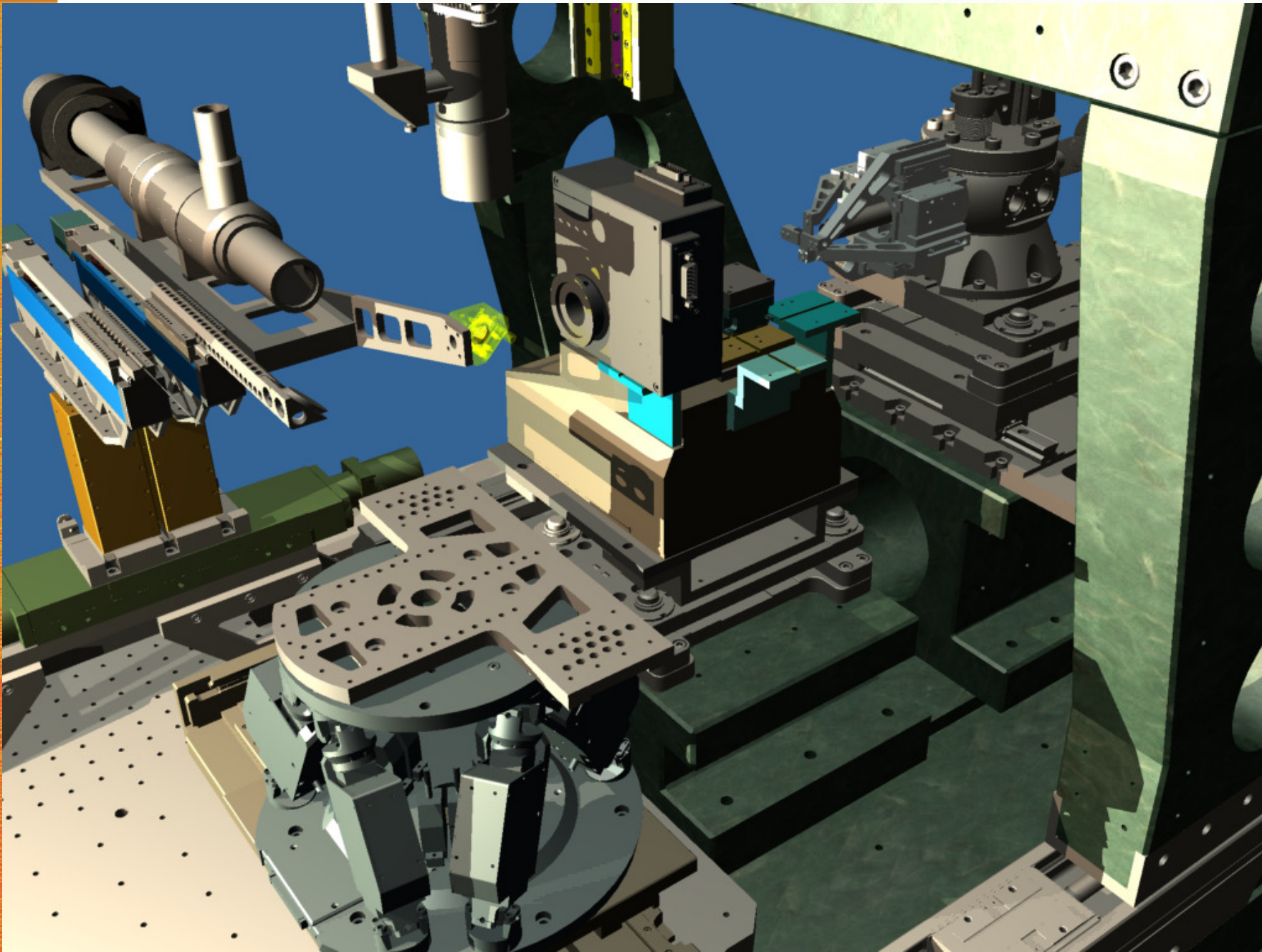
F-206



M-824

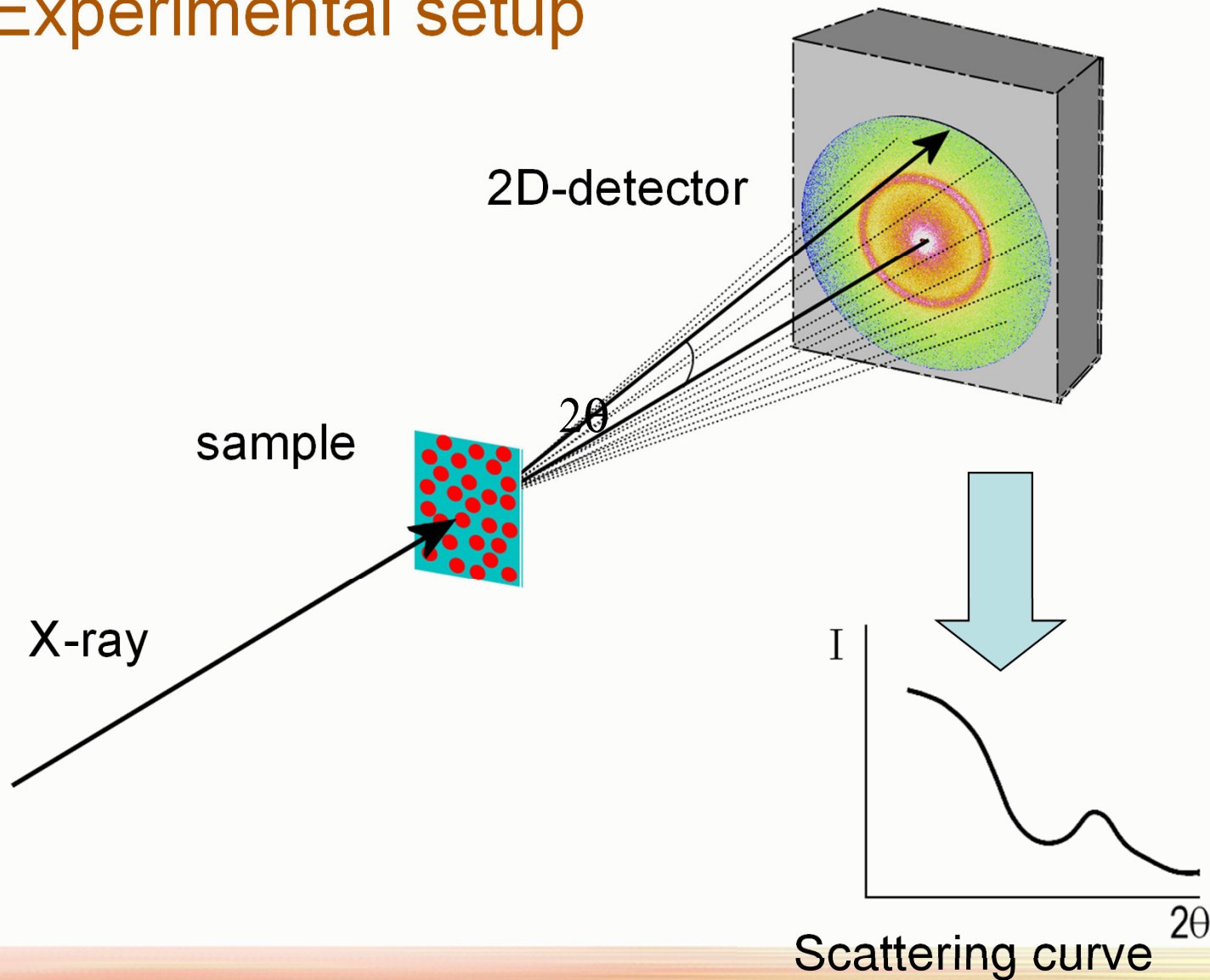
Type	P-611 XZ stage	F-206 hexapod	M-824 hexapod
max. load	1.5 kg	2 kg	10 kg
travel range	$\pm 100 \mu\text{m}$	$\pm 6 \text{ mm}$, $\pm 6^\circ$	$\pm 22.5 \text{ mm}$, $\pm 12.5^\circ$
resolution	$< 10 \text{ nm}$	100 nm, $2 \mu\text{rad}$	300 nm, $3.5 \mu\text{rad}$

Initial setup



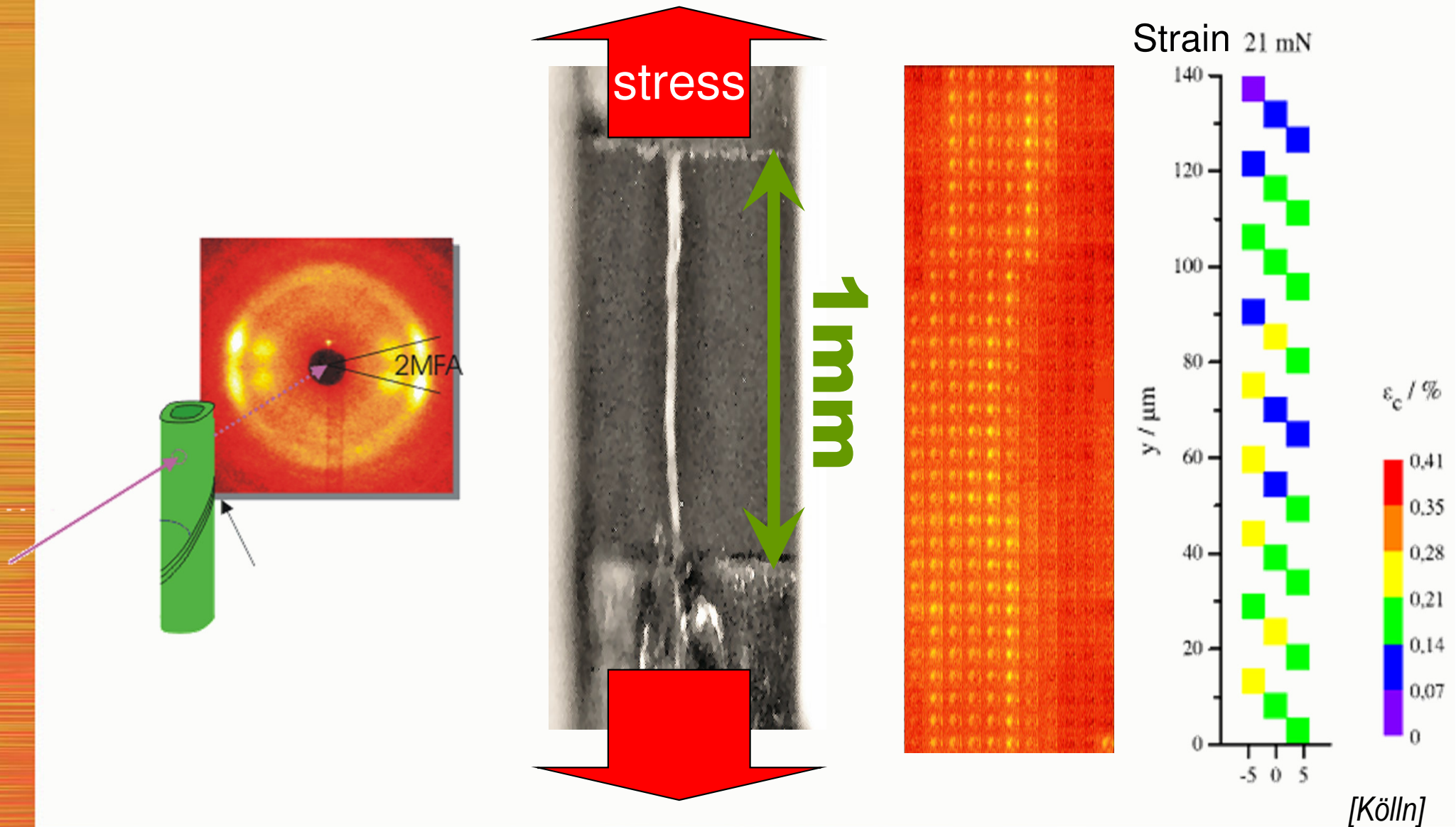
Small/Wide-Angle X-ray Scattering (SAXS / WAXS)

Experimental setup



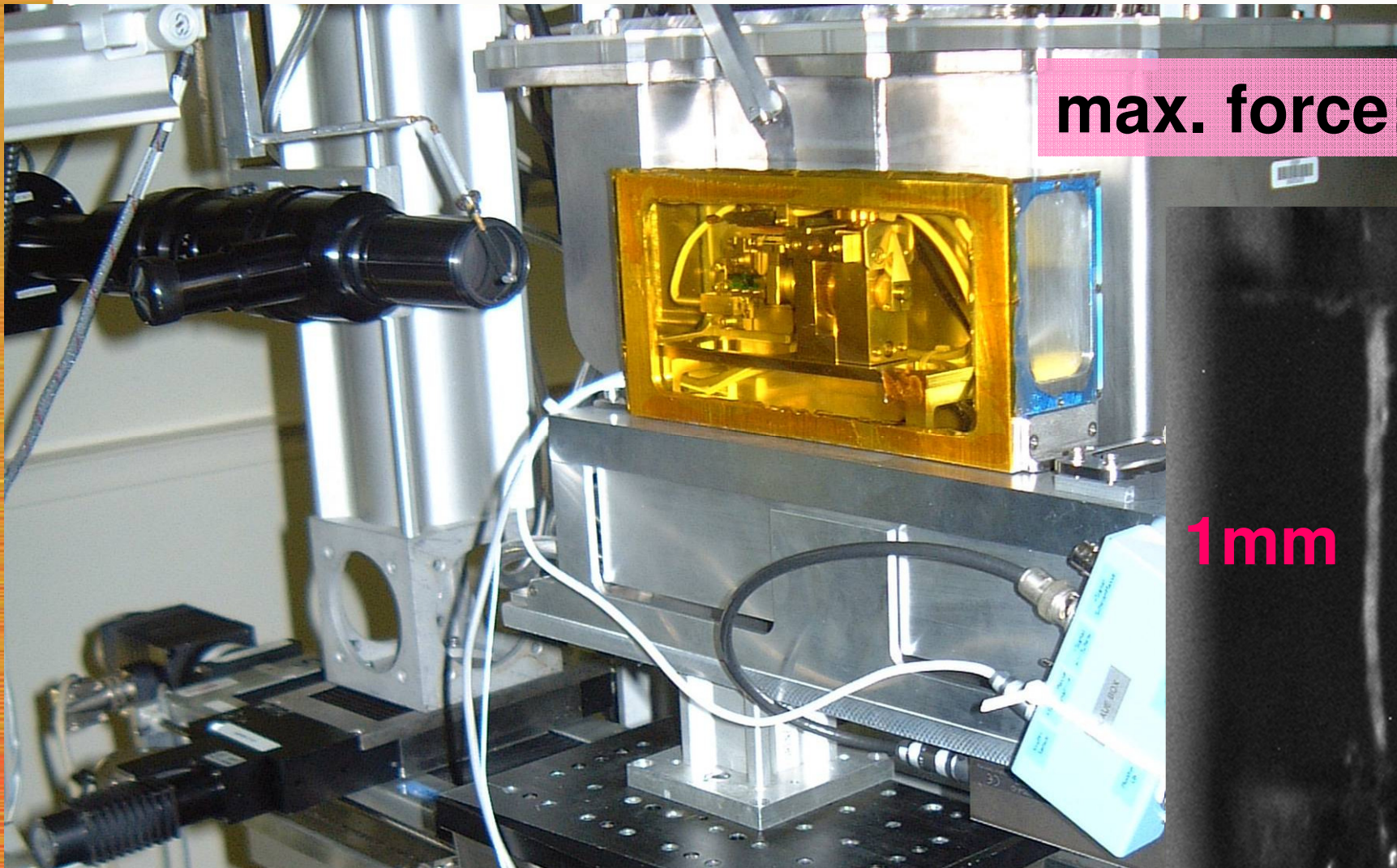
Scanning SAXS/WAXS with sub- μm resolution

Applications



Single fibre tensile test with humidity control

Applications



max. force: 0.5 N

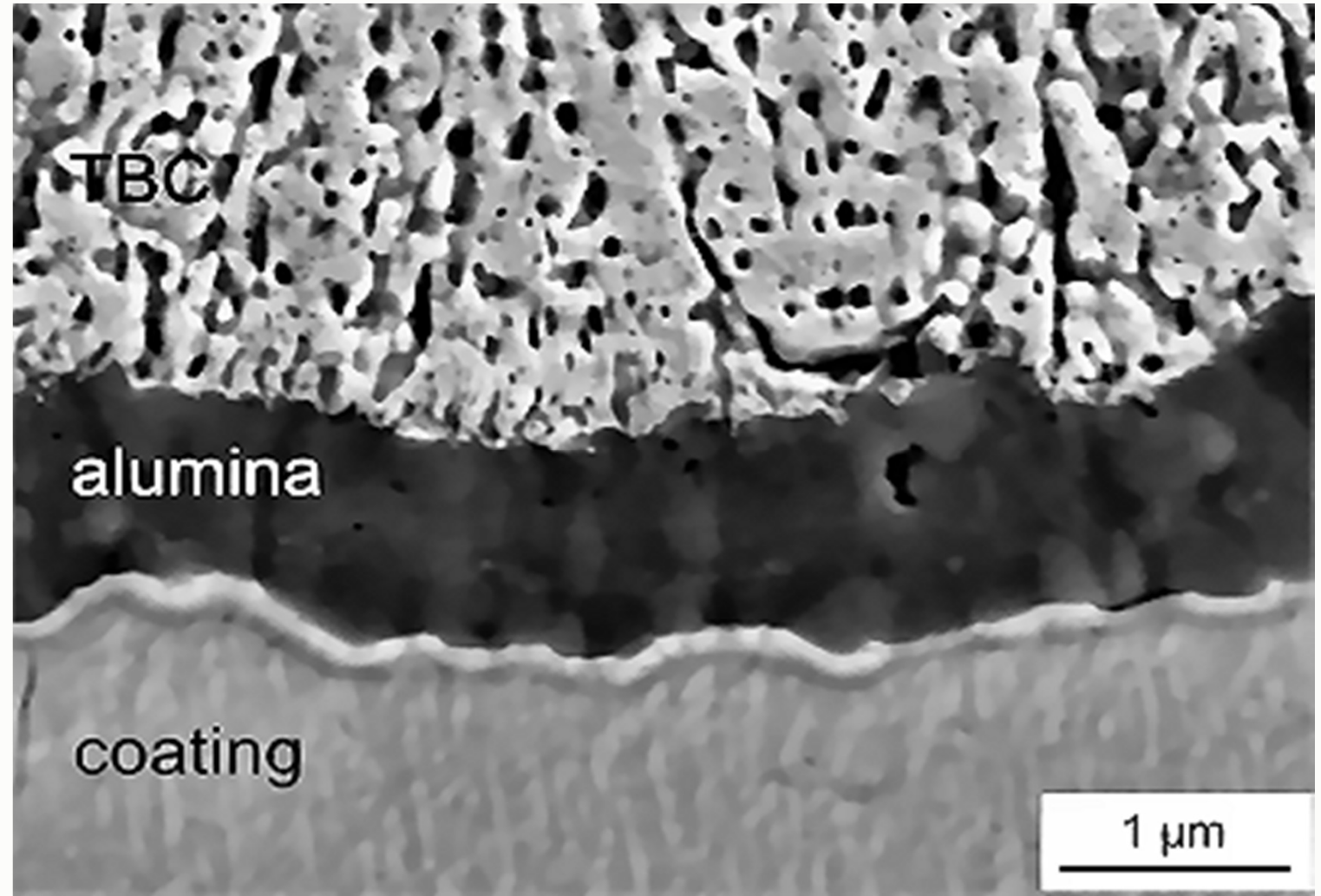
1mm



I. Krasnov (2007)

Scanning XRF
with sub- μm resolution

Applications



A thermal barrier
coating (TBC)
deposited onto
aluminidecoated
TiAl alloy
Ti-45Al-8Nb.

Summary

- A lot of new and exciting equipment is coming up in Hamburg
- Spatial resolution boundaries are about to be torn down
- Operational status is expected by the end of 2009 / beginning of 2010
- Potential applications can be found in virtually any kind of condensed matter research

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Igor Krasnov

Stephan Roth

Martin Müller

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Thank you for your attention

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