

MAX-lab

Status Report

New organisation

New group: Computing Services & Control Systems

- Head: Krister Larsson
- Developers:
 - Jüri Tagger
 - Andreas Persson
 - Yury Gaponov
 - Mirjam Lundquist (Starting autumn 2010)
 - Darren Spruce (1 year)
 - Piotr Goryl (Polish synchrotron to be built)

Current TANGO activities

Infra structure

- Source code repository
- Issue tracker
- Virtualisation
- ...

Deploying DS at present accelerator

- Allen Bradley PLC
- BPM monitor

Archiving server

Beamline projects

TANGO course

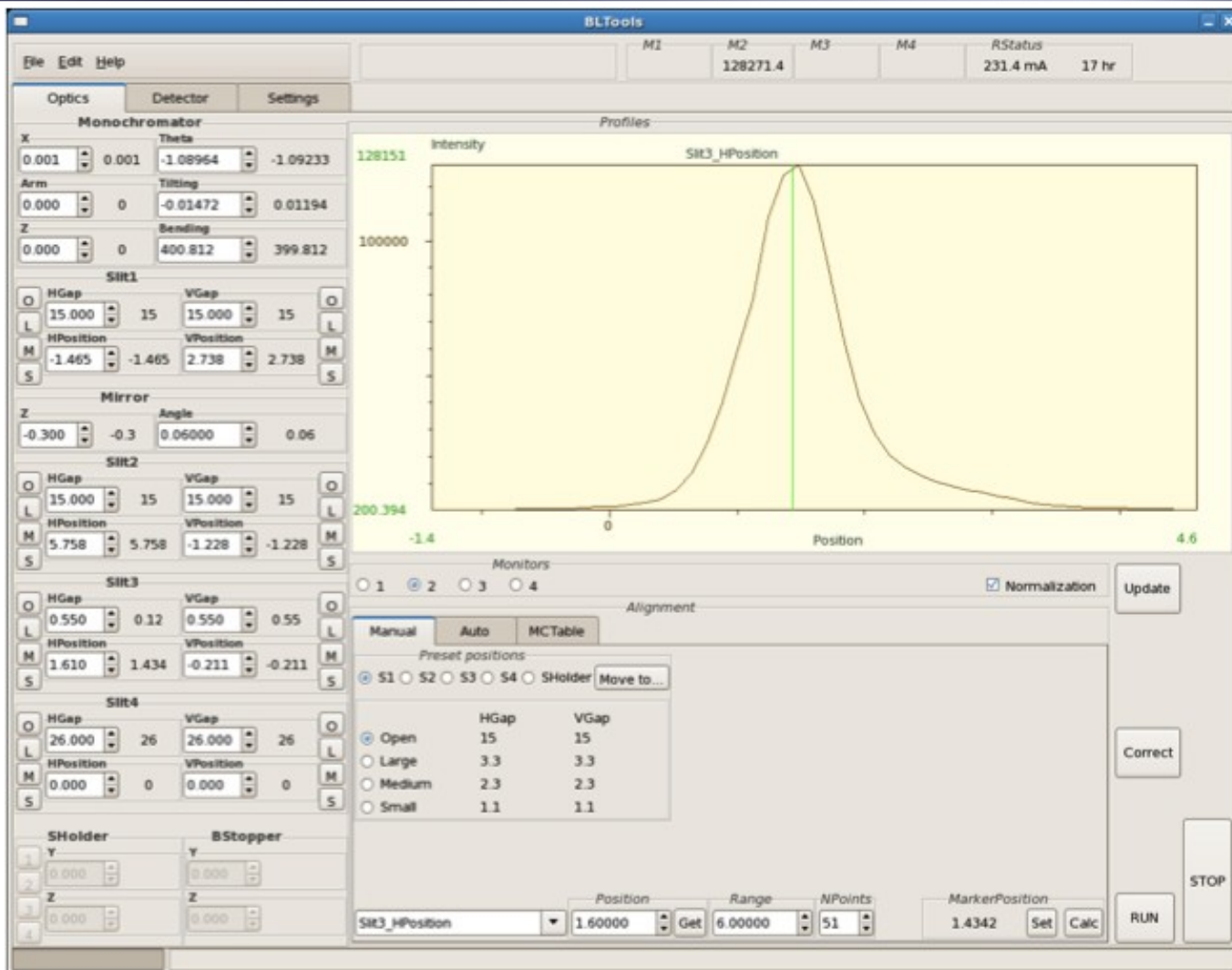
Signal list for MAX IV accelerators distributed

Beamline project, I911-4

Tango controlled SAXS beamline

- Device Servers
 - Monochromator, mirrors, slits, translation stages, detector
- Alignment procedures
 - The station has some tricky mechanics
 - Automatic alignment

Beamline project, I911-4



Beamline project I511

New Soft X-ray spectroscopy beamline

Initial control system design study performed by COSYlab (TANGO based)

- Continuous energy scan with synchronised movement of undulator and monochromator
- Includes cameras, slits, optical systems
- Does not include the detector system

Beamline I911-3

MD-2 diffractometer in operation
Sample changer on the way



Beamline I711

**Newport diffractometer to
be installed september
2010**



MAX IV

Build start ~ summer 2010

- Vibration study involving a whole department at Lund University
- MAC meetings starting fall 2010

>3 GeV Linac

- Call for tender of the Linac structure is in progress

Short Pulse Facility

- Time resolved diffraction and XAFS
- Two ID's, undulator and wiggler

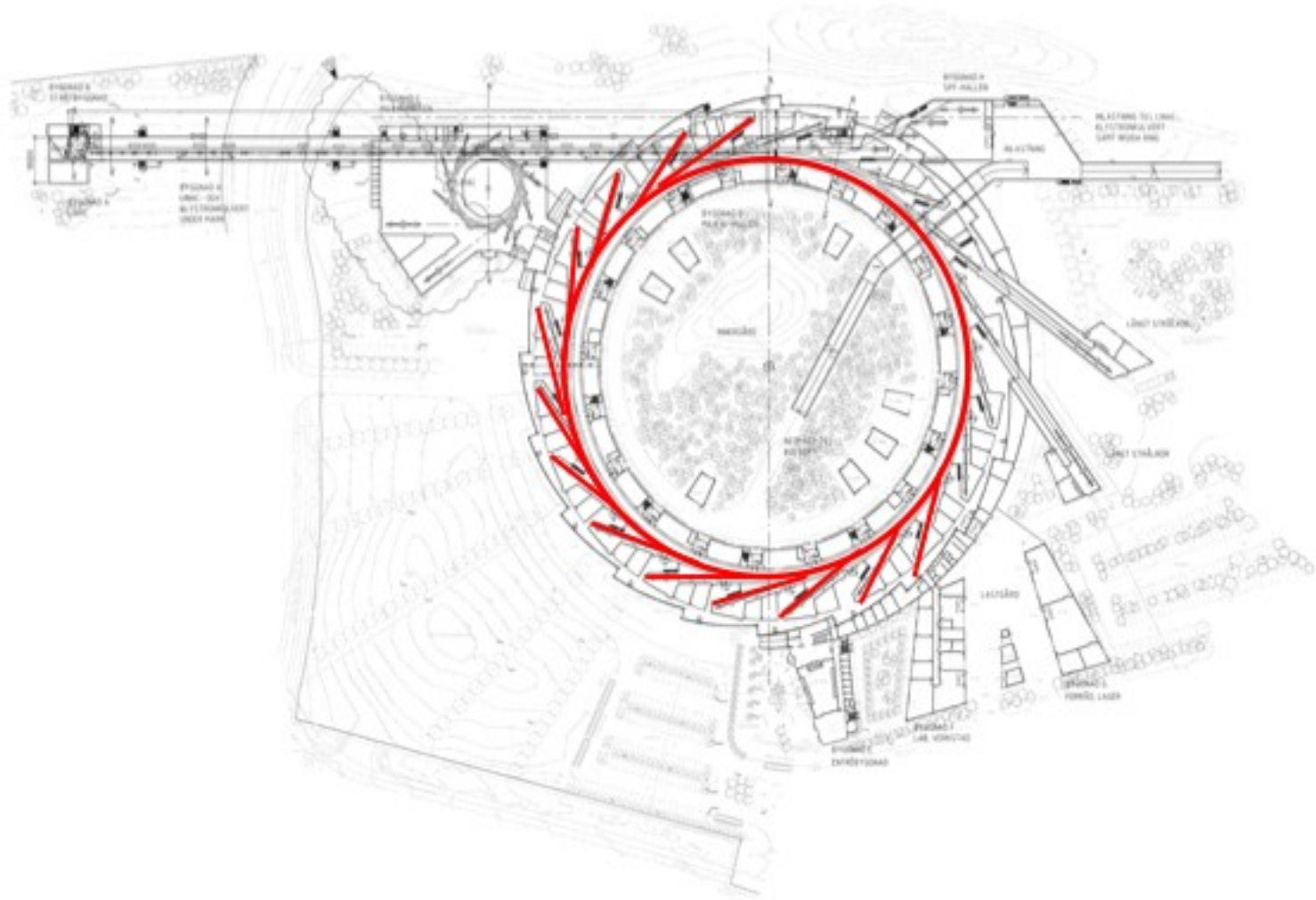
3 GeV ring ~20 straight sections 500m diameter

- Magnet ready for test measurements
- Catalog of suitable ID's ready

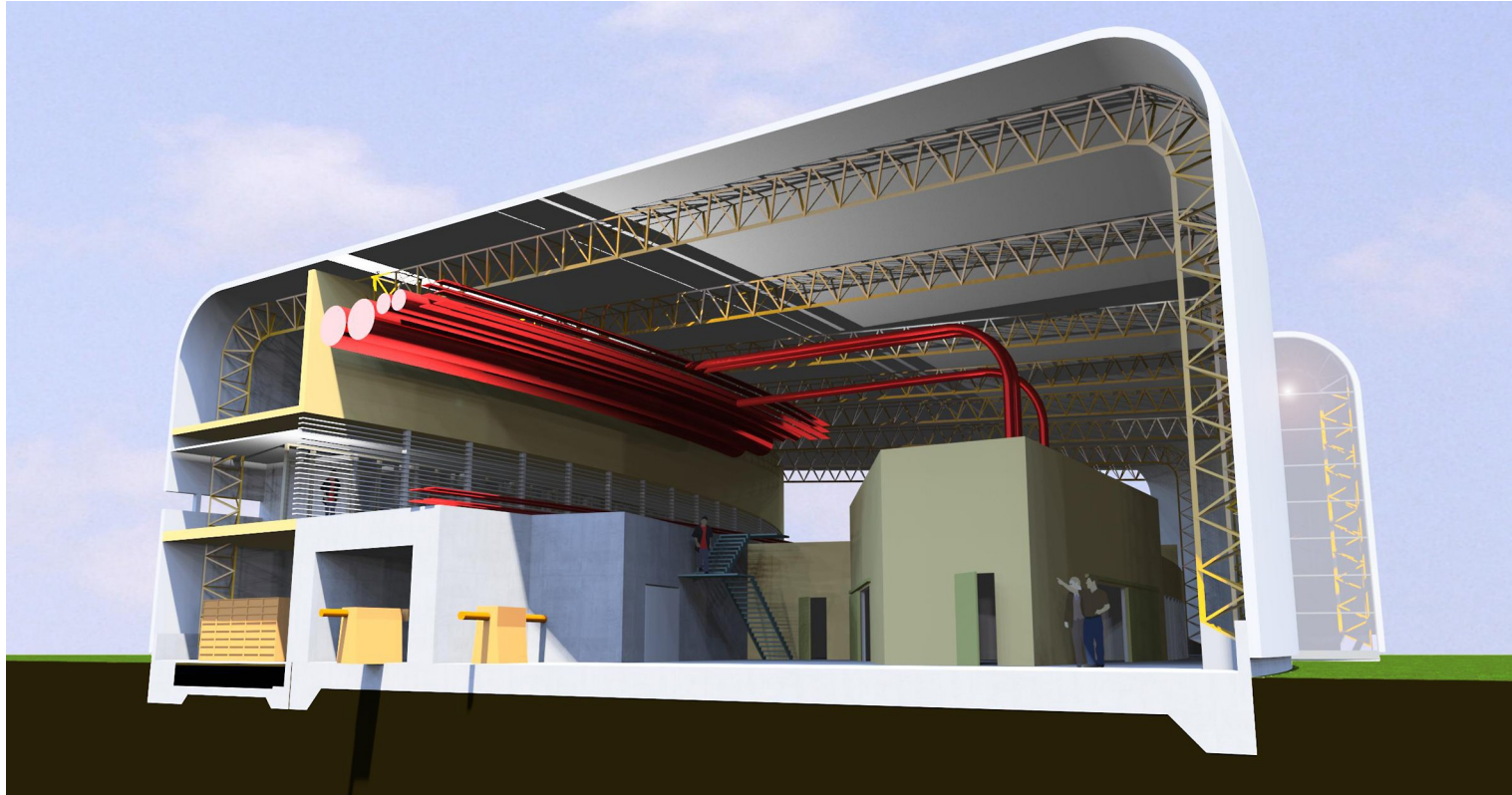
1,5 GeV ring ~12 straight sections

- Two will be built, one at MAX IV and one in Poland

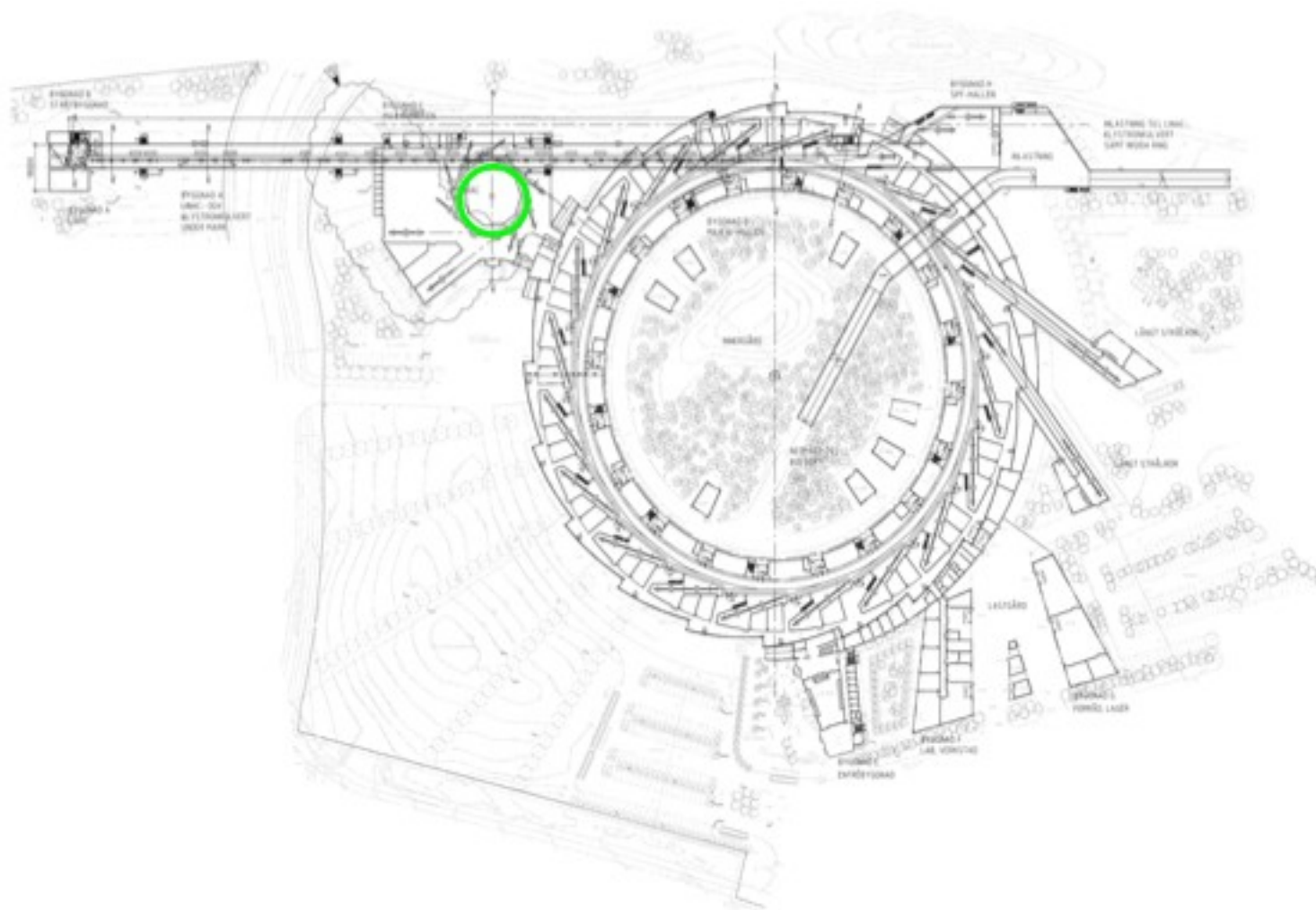
MAX IV 3 GeV ring



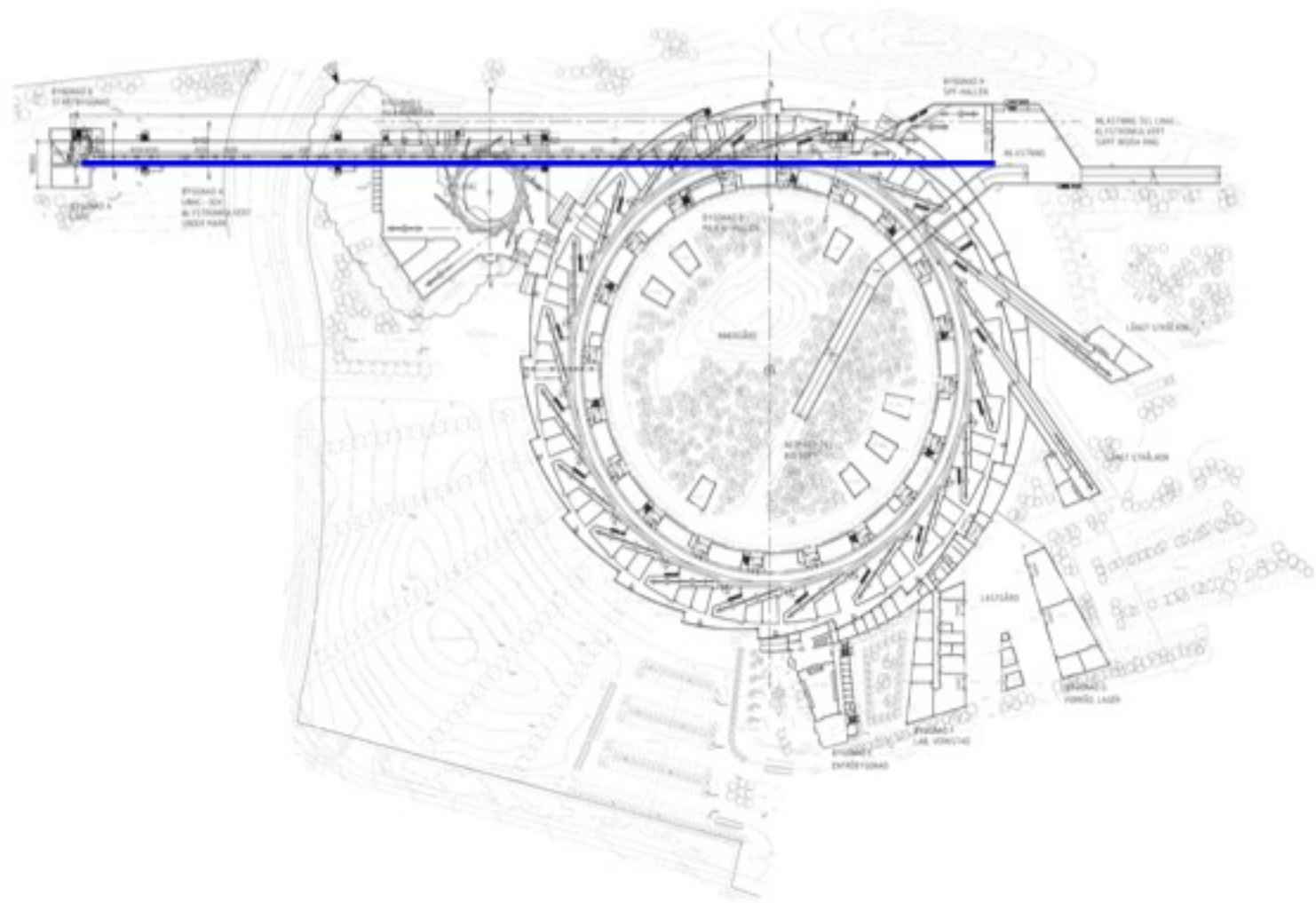
MAX IV 3GeV ring



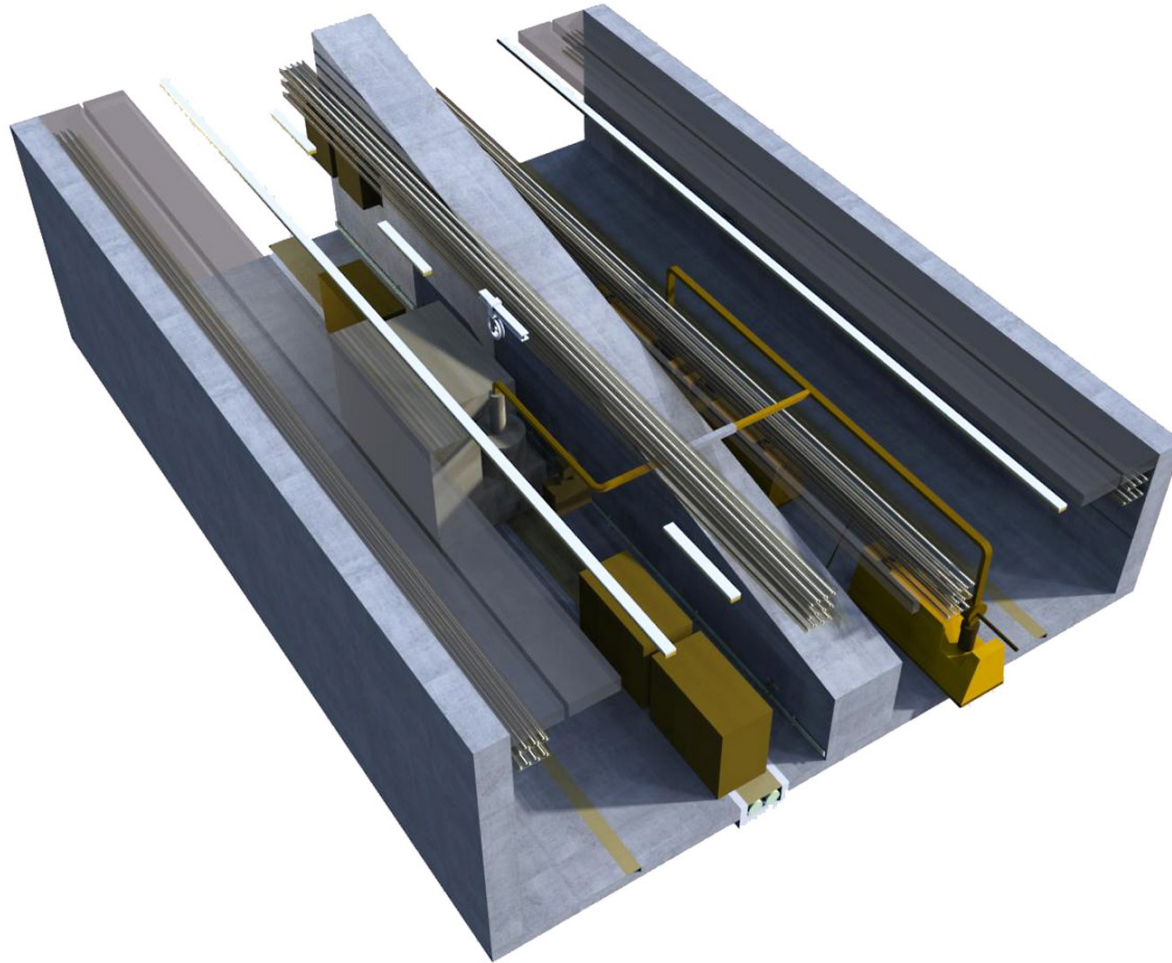
MAX IV 1,5 GeV ring



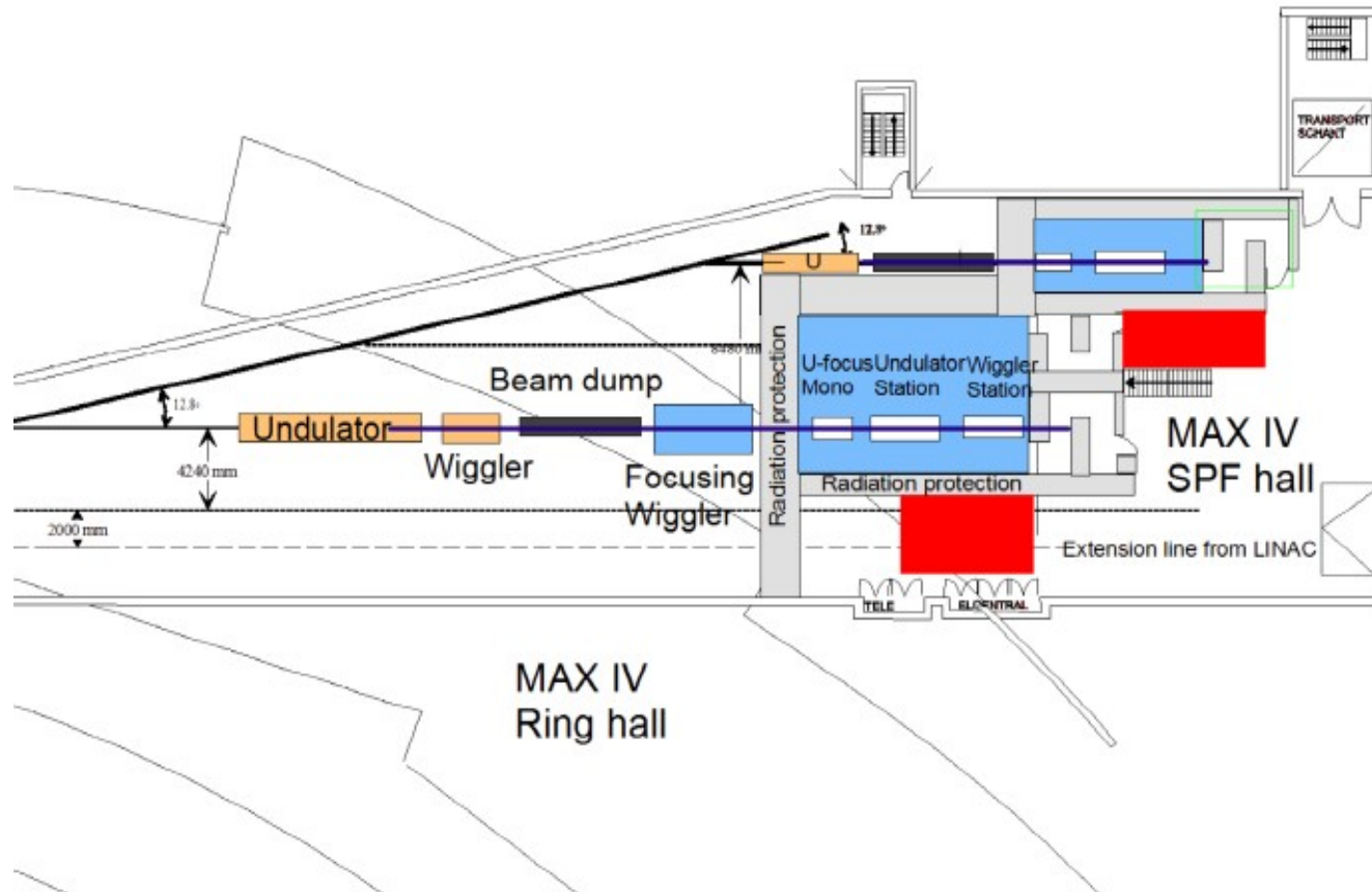
MAX IV Linac and SPF



MAX IV Linac



MAX IV SPF



MAX IV SPF

Energy (wavelength) range	1.8 -20 keV (0.6 – 6.5 Å)	1.8 -30 keV (0.4 – 6.5 Å)
Photon source	In-vacuum undulator	Wiggler
Monochromator	Double crystal monochromator with Si(111) InSb(111) crystals. Multi-layer mirrors	Same as undulator mono White-light option
Photons per pulse 1% BW	$>1 \cdot 10^7$ below 12 keV	$>1 \cdot 10^6$ below 20 keV
Repetition rate	100 Hz	100 Hz
Harmonic content	$<10^{-3}$	$<10^{-3}$
Bandwidth	Si $\Delta E/E \approx 2 \cdot 10^{-4}$ (2.5-20 keV) InSb $\Delta E/E \approx 4 \cdot 10^{-4}$ (1.8-20 keV) ML $\Delta E/E = 0.01$ (1.8-20 keV)	Si $\Delta E/E \approx 2 \cdot 10^{-4}$ (2.5-30eV) InSb $\Delta E/E \approx 4 \cdot 10^{-4}$ (1.8-30 keV) ML $\Delta E/E = 0.01$ (1.8-30eV)
Monochomator throughput @ 5 keV	$>70\%$ crystal $>50\%$ ML	$>70\%$ crystal $>50\%$ ML
Optics	Unfocused/ micro focus	Gold coated Si mirror
Polarization	Linear	Linear
Pulse duration	<100 fs	<100 fs
Synchronization	<1 ps	<1 ps
Spot size on sample	0.2 x 0.2 mm ² unfocused 2 x 2 μm ² microfocus	0.05 x 0.5 mm ²
Equipment	Ultrafast laser (3 mJ) 4-circle goniometer CCD detector Pilatus detector	Ultrafast laser (3 mJ) Bolometric detector Dispersive EXAFS

MAX IV Beamlines

Basic Version, 2009-2014

Building, accelerators and a basic version of beamlines.

In total 110 M€

The founding was secured at April the 27th 2009 when a Memorandum of Understanding was signed between the Swedish Research Council (VR), the Swedish Governmental Agency for Innovation Systems (VINNOVA), Lund University and Region Skåne, defining the start of the MAX IV project.

Supplements, 2010-

Additional beamlines and laboratories.

Proposal to KAW and ongoing negotiations with "Research Councils" and universities in neighbouring countries.

The movie

