Status of MXCuBE Beamline Control at BESSY II

Michael Hellmig,
on behalf of the HZB-MX group

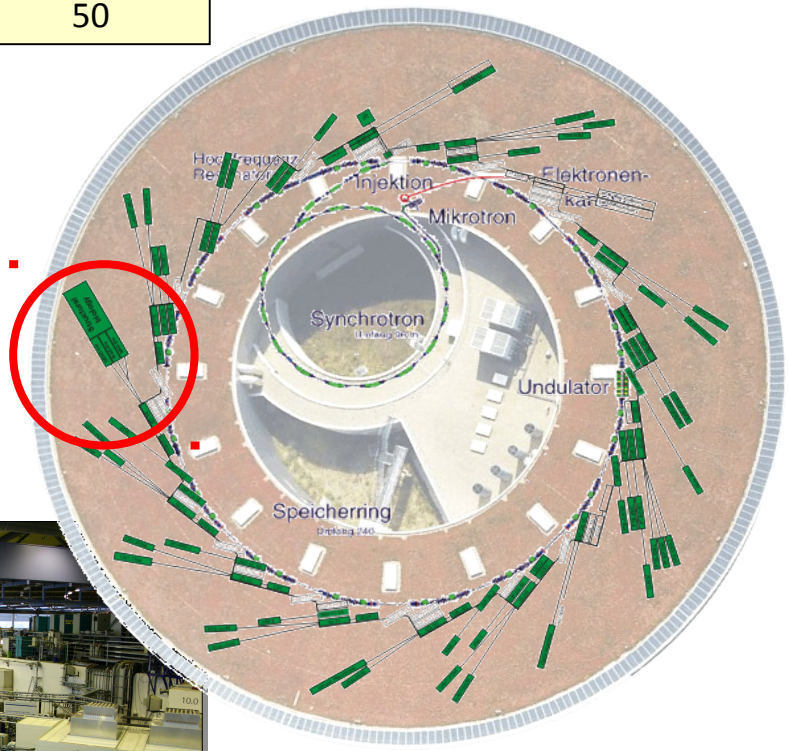
MXCuBE/ISPyB Joint Meeting, 11.09.-13.09.2018,
Elettra

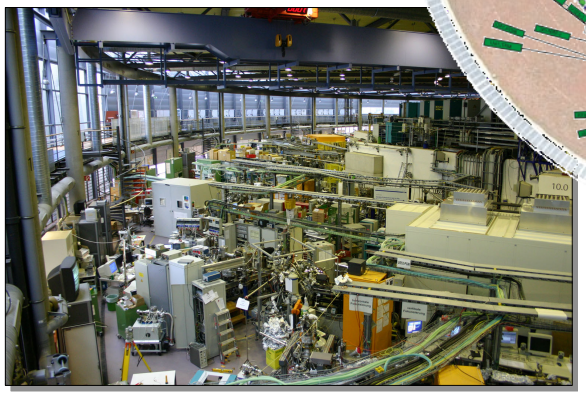
BESSY II synchrotron characteristics

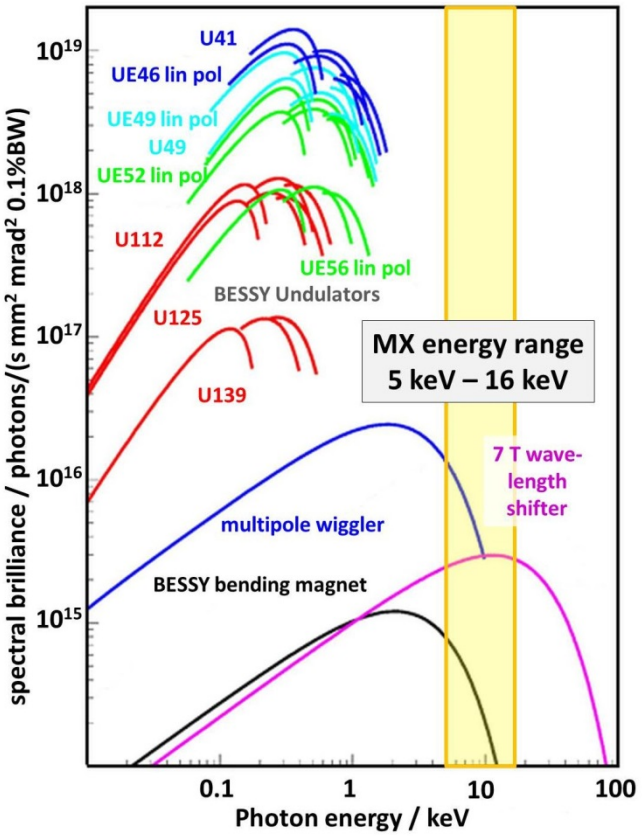
BESSY II ring parameters:

Electron Energy:	1.7 GeV
Electron Current:	300 mA
Circumference:	240 m
Straight sections:	16
Beamlines:	50

Synchrotron sources at BESSY II







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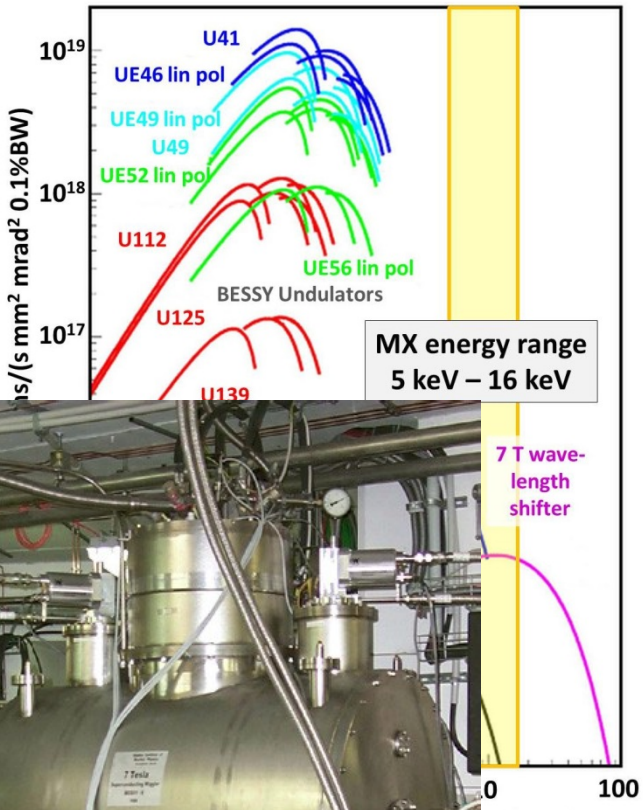
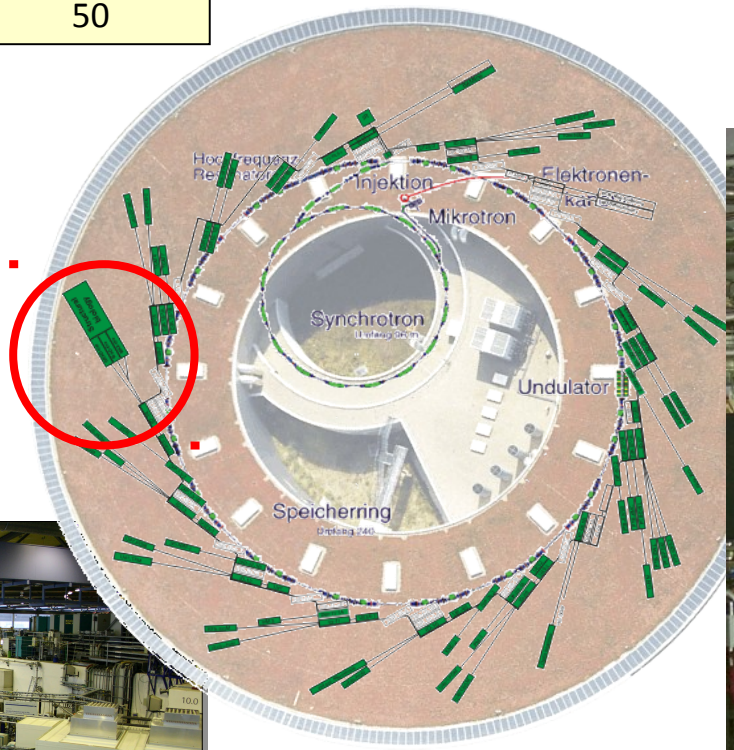
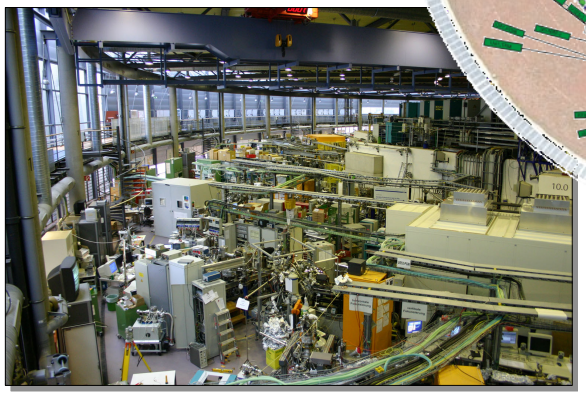




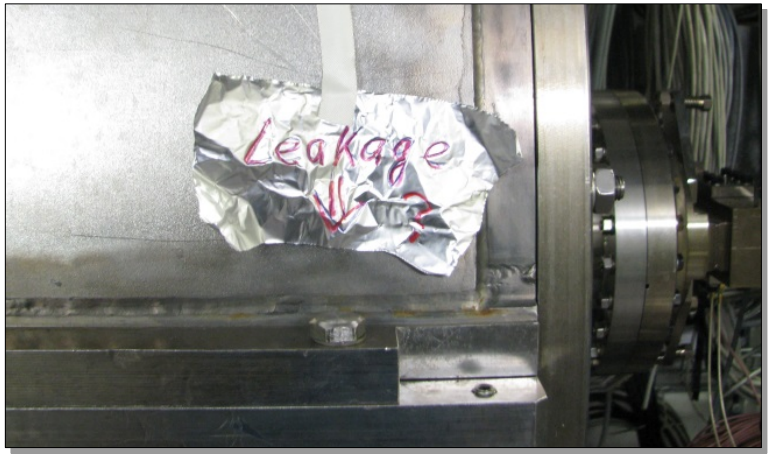


HZB-MX insertion device: WLS7T wavelength shifter

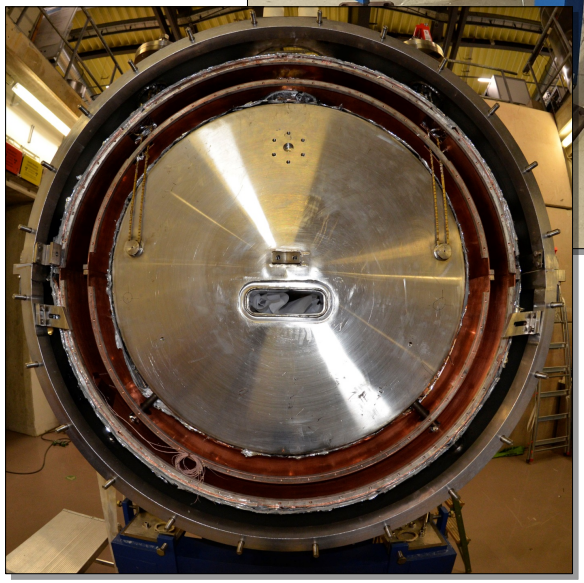
E_{crit}: 13.45 keV

[Budker Institue of Nuclear Physics, Novosibirsk 2000]

HZB-MX WLS7T wavelength shifter maintenance



HZB-MX WLS7T wavelength shifter maintenance



7 Tesla Wavelength Shifter
built by
Budker Institute,
Novosibirsk, Russia

MX experimental floor at BESSY II

BL 14.1 MAD

- MD2 with MK3
- Pilatus2 6M 12 Hz
- CATS: 90 SPINE samples

- MXCuBE 2.2 Qt4

- standard user operation schedule:
  24/5 (Tuesday to Saturday)

BL 14.3

Upgrade in Progress

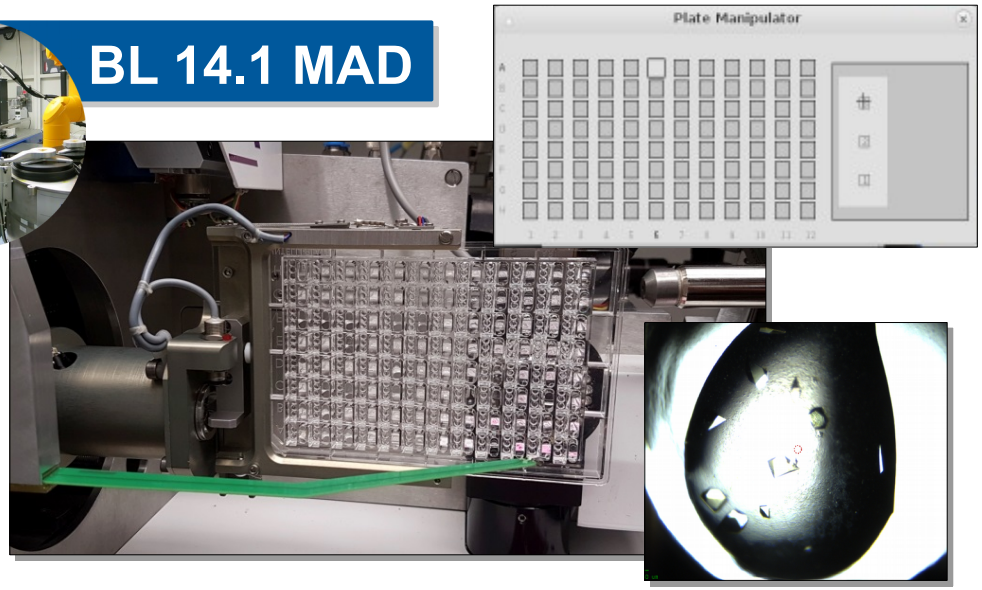
BL 14.2 MAD

- Nanodiff goniometer
- Pilatus3 2M
- [GROB: 294 SPINE & Unipuck samples]

- MXCuBE 2.2 Qt4

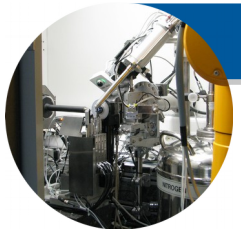
MX instrumentation upgrades

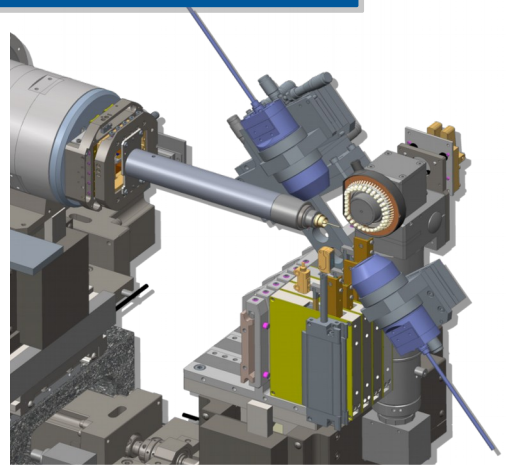
BL 14.1 MAD



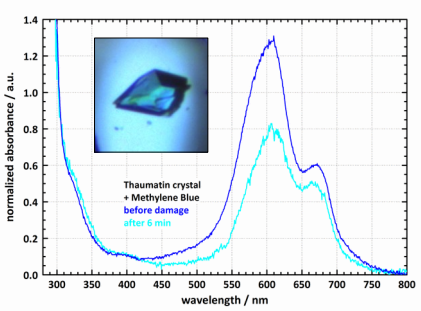
- MD2 plate manipulator:
- available for user operation
- available at upgraded BL14.3 with MD2S

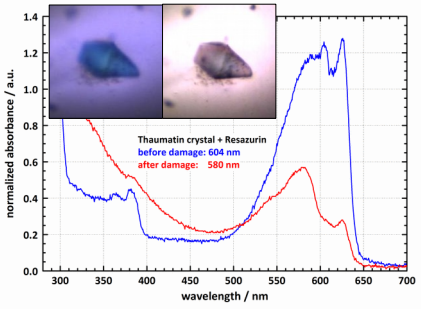
BL 14.2 MAD

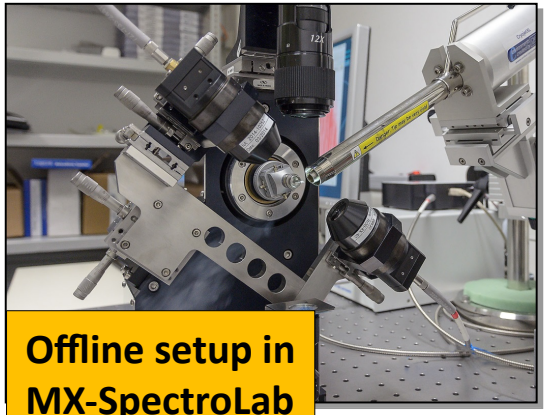




Microphotospectrometer

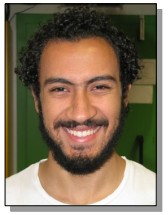






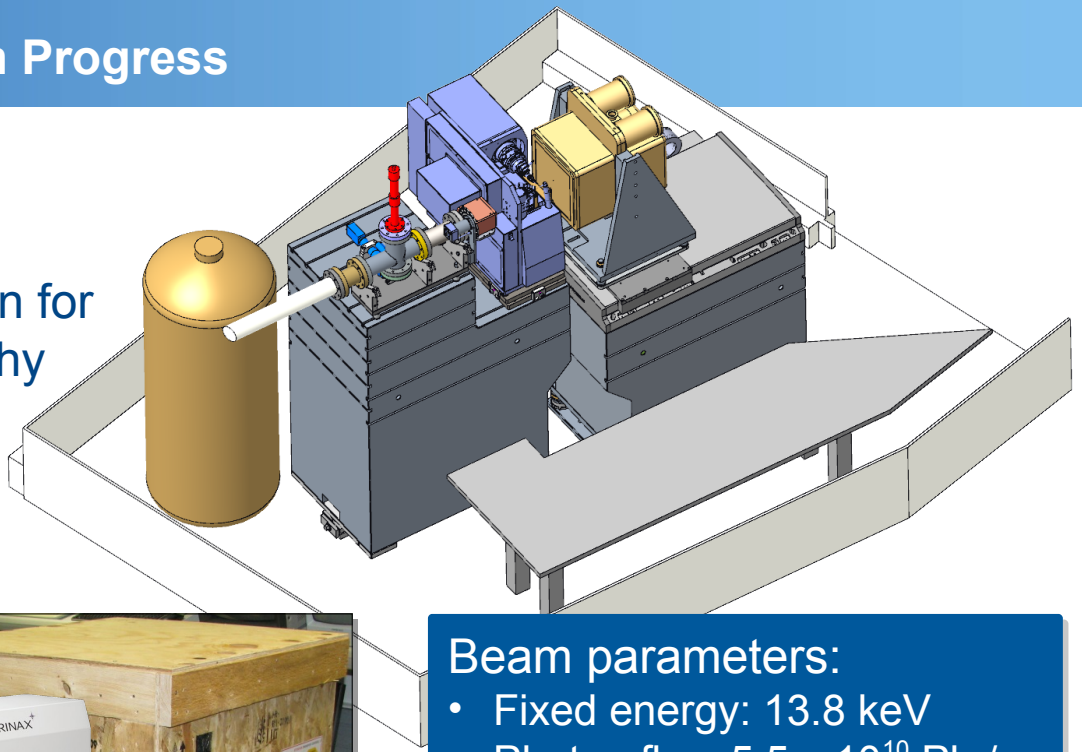
Offline setup in MX-SpectroLab

Omar M. El Sayed,
University of Science and Technology
Zewail City, Egypt

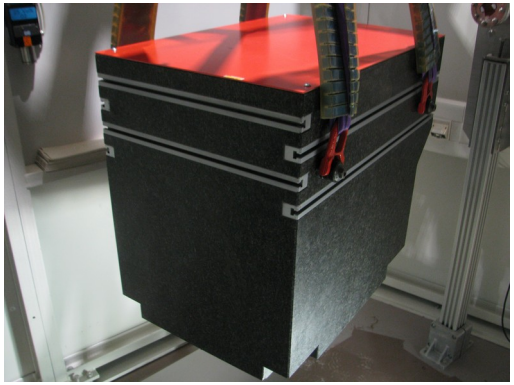


MX beamline 14.3: Update in Progress

- Main purpose:
  - crystal optimization
  - high-resolution data collection for small-molecule crystallography



Beam parameters:
- Fixed energy: 13.8 keV
- Photon flux: 5.5 x 10^{10} Ph./s

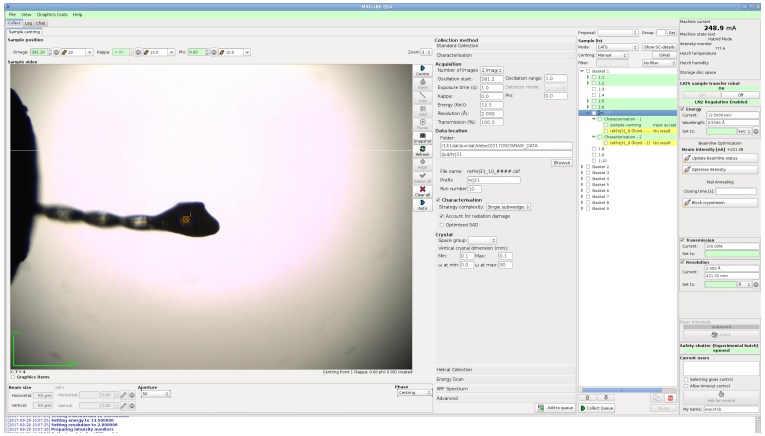


cw 37: mounting goniometer granite → cw 40: mounting detector stage → cw 42/43: MD2S installation → cw 44+: commissioning & control-software setup

MX beamline 14.3: Control-software setup

- Main components:
  - Arinax MD2S
  - Rayonix MX225
  - Arinax HClab
  - Arinax REX nozzle changer

- Control-software setup:
  - CSS SPEC
    beamline control
  - **MXCuBE Qt4**
    experiment control
  - HClab integration



  - MD2S:
    standard exporter/Tango protocols
  - MX225:
    detailed detector setup open, use of LimA framework to be evaluated

MXCuBE: status and future plans

- current status:
  - **MXCuBE development delayed** due to instrumentation developments and problems
  - **MXCuBE 2.2 Qt4 running on both tunable beamlines** BL14.1 and BL14.2,
    control-software setup including **MXCuBE2 Qt4 in preparation for currently upgraded BL14.3** experimental station
  - ongoing **migration works towards use of abstract classes**: GenericDiffractometer, AbstractCollect
  - **migration to new MXCuBE repository layout** with single HardwareRepository submodule **in progress**
- short- and mid-term plans:
  - **evaluate Python3 and Qt5 compatibility** to comply with current standard Linux installations
  - **MXCuBE3 evaluation**

Acknowledgements

BESSY-MX team

Christian Feiler
Ronald Förster
Martin Gerlach
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Alexandra Kastner
Luckas Schmuckermaier
Michael Steffien
Helena Taberman
Piotr Wilk
Manfred Weiss
Jan Wollenhaupt

The MXCuBE collaboration

Industrial partners:

Thank you for your attention.

Questions?