



# Progress report on the SOLCRYS laboratory construction at SOLARIS synchrotron

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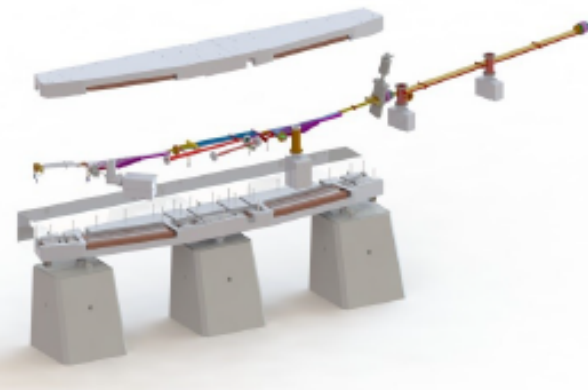
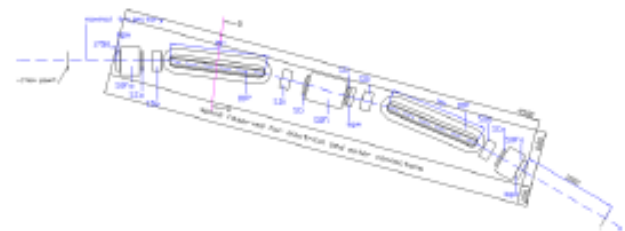
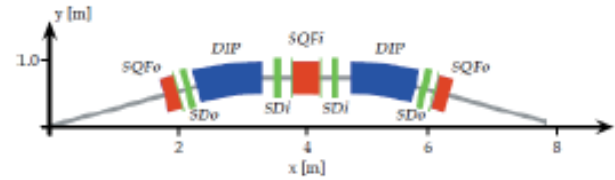
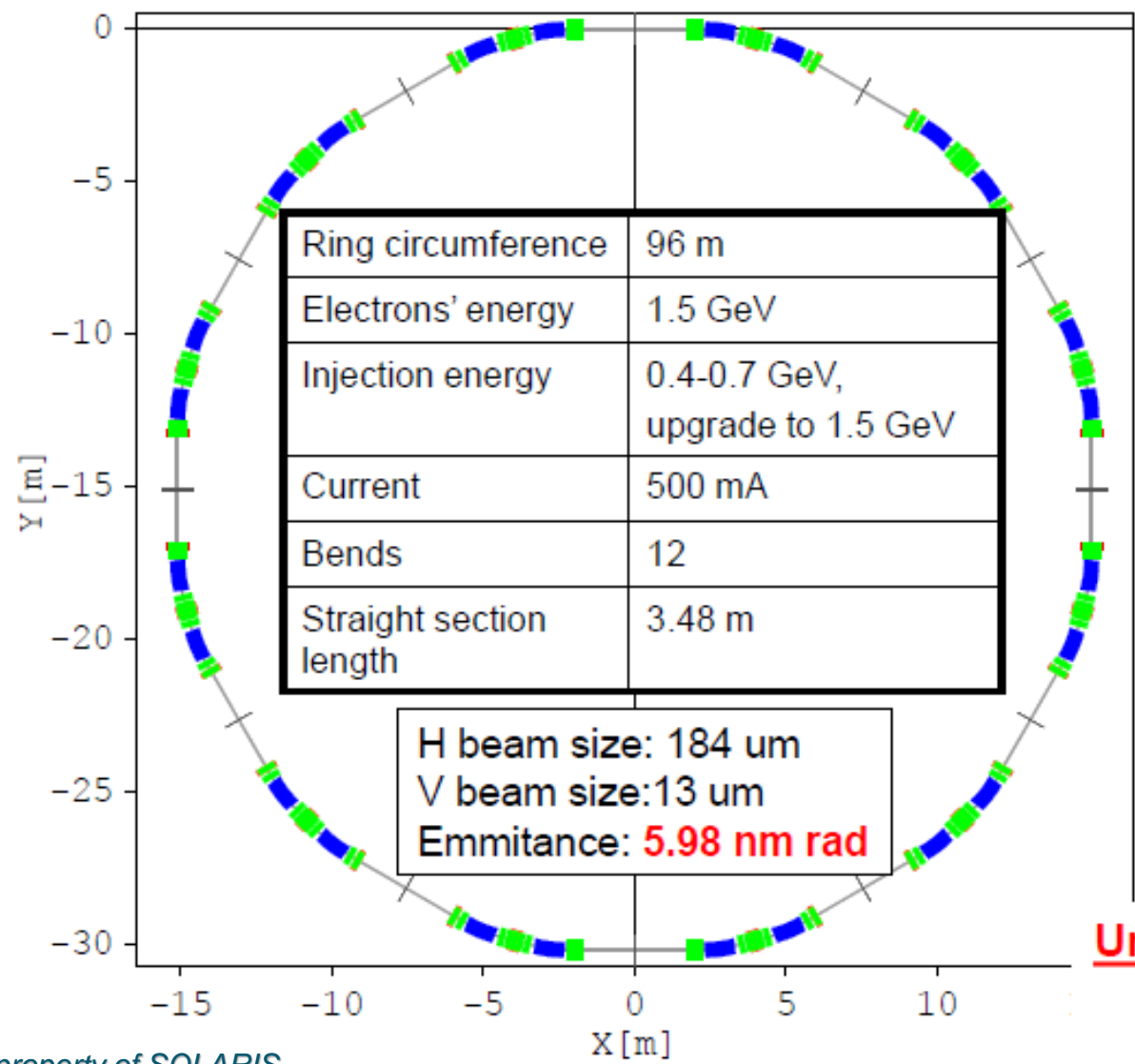


# Outline

- SOLARIS machine and beamlines
- SOLCRYS laboratory for Condensed Matter Research
- Experimental hall extension
- Synchrotron radiation source
- JINR beamlines



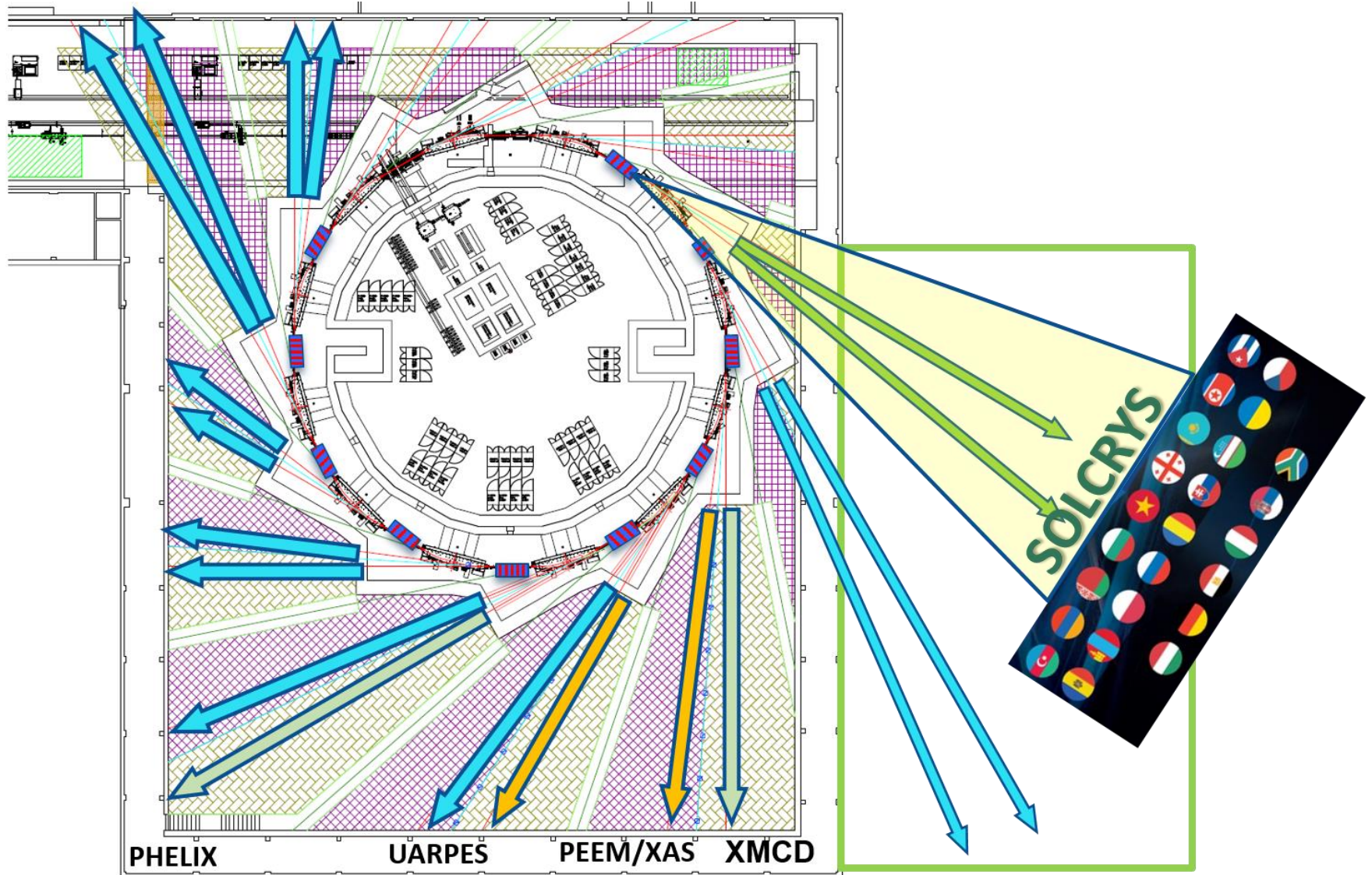
# SOLARIS machine



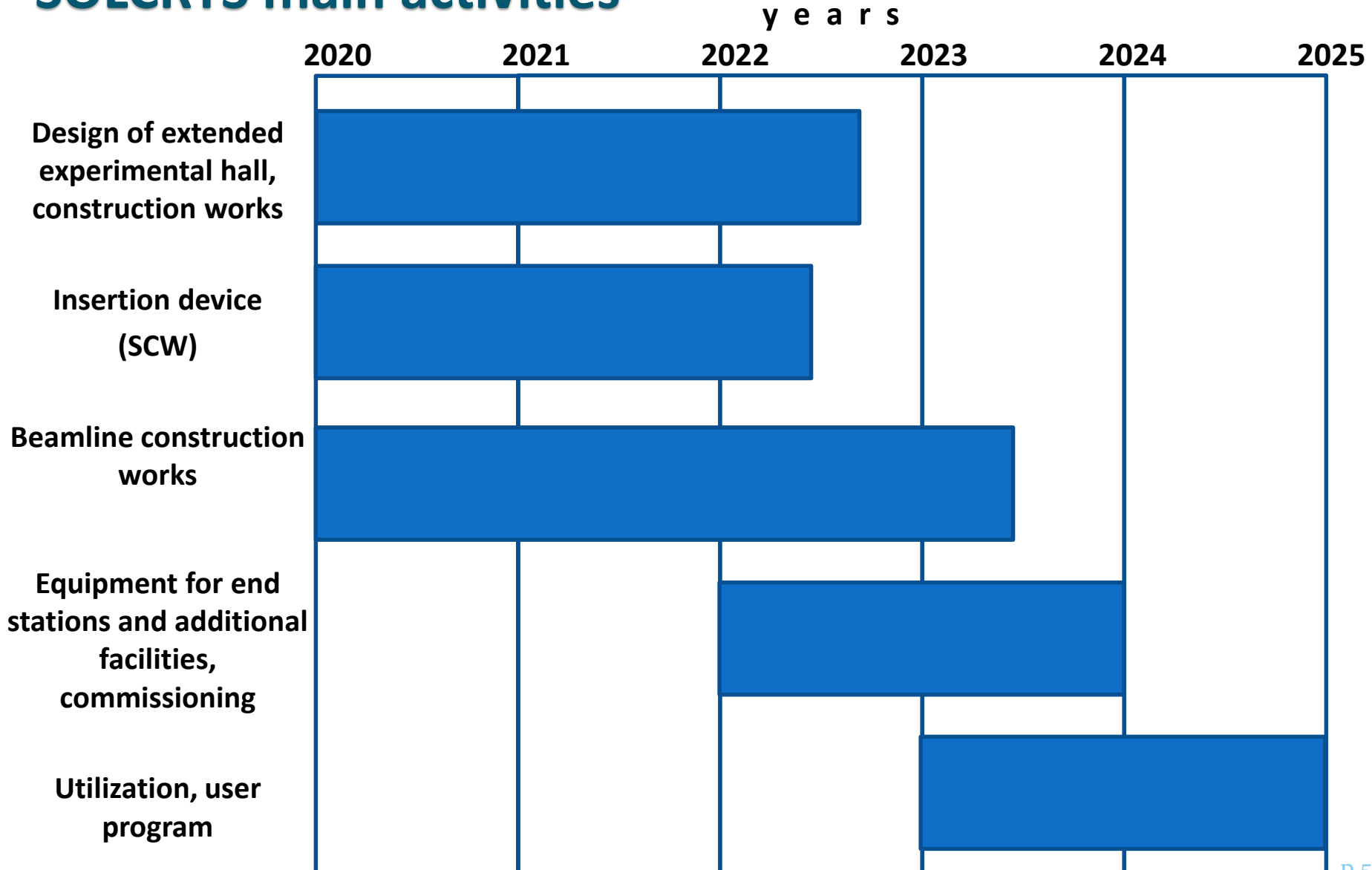
**Unique, state of the art solution**  
**Integrated magnets**



# SOLARIS beamlines



# SOLCRYS main activities





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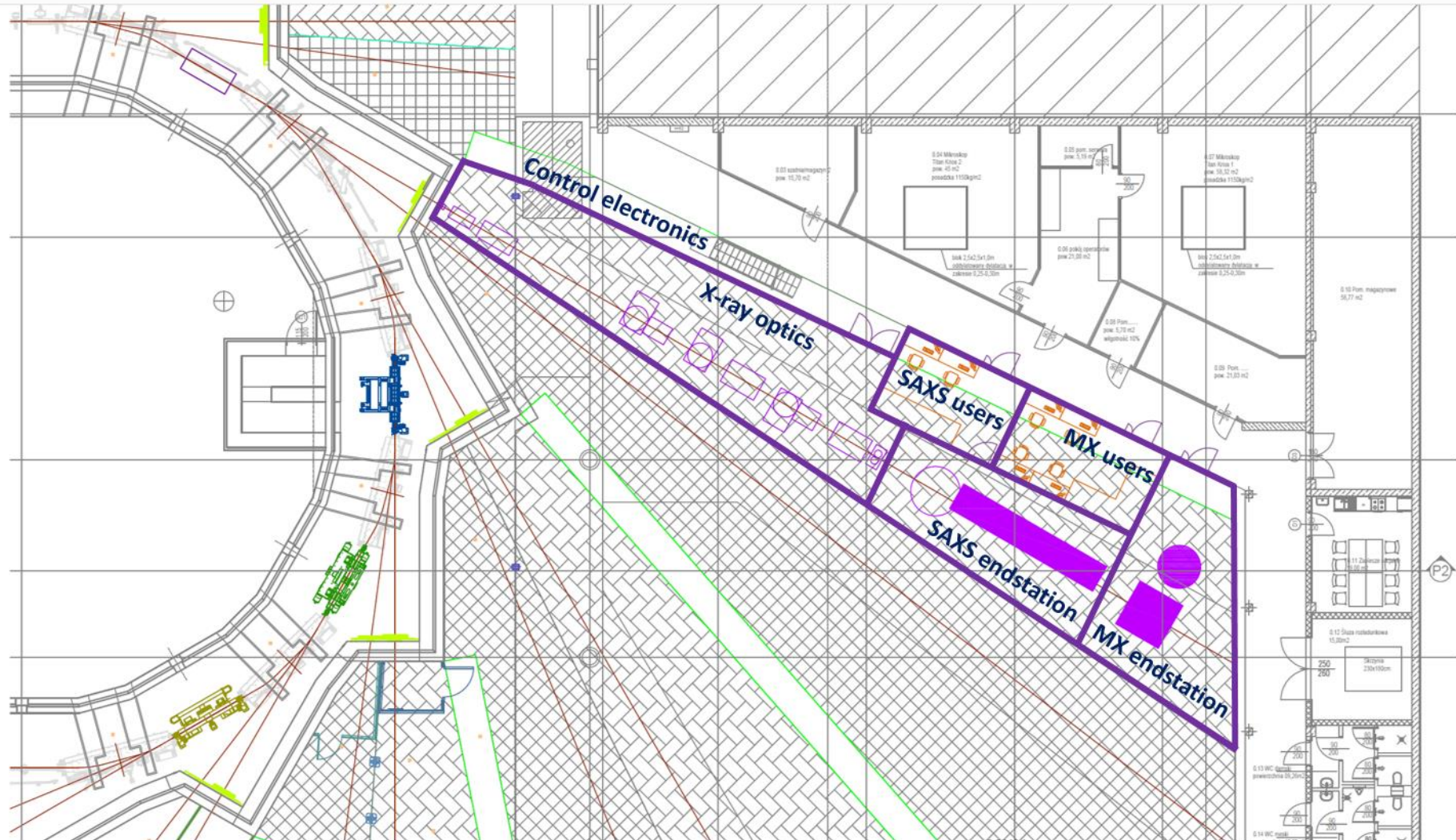


## Extension hall activities

- **Conceptual design project was prepared**
- **Full tender documentation for executive project was assembled**
- **First tender – December 2019**
  - **price limit exceeded**
- **Second tender – January 2020**
  - **closed in February 2020**



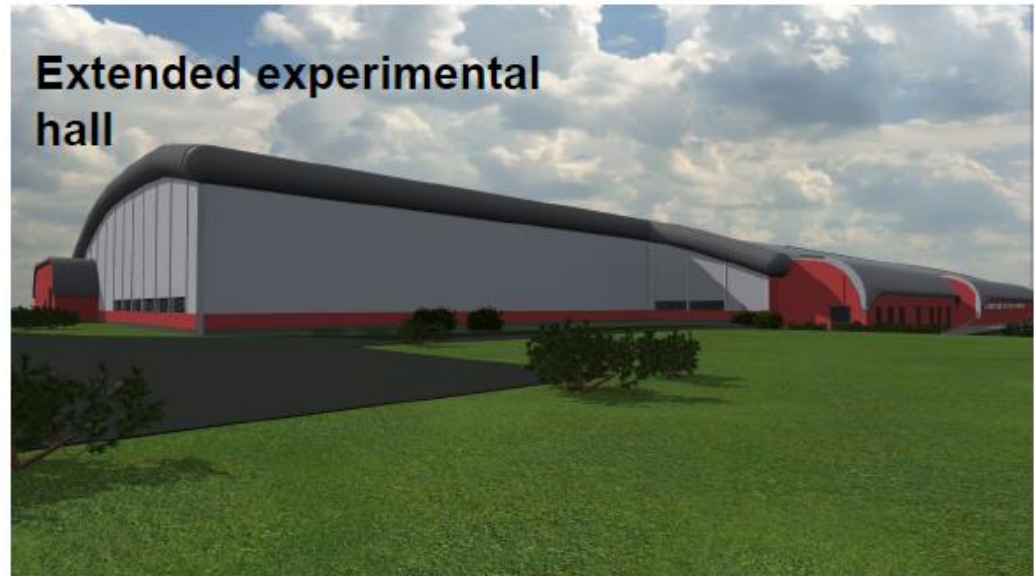
# Experimental hall extension







# Extension hall design





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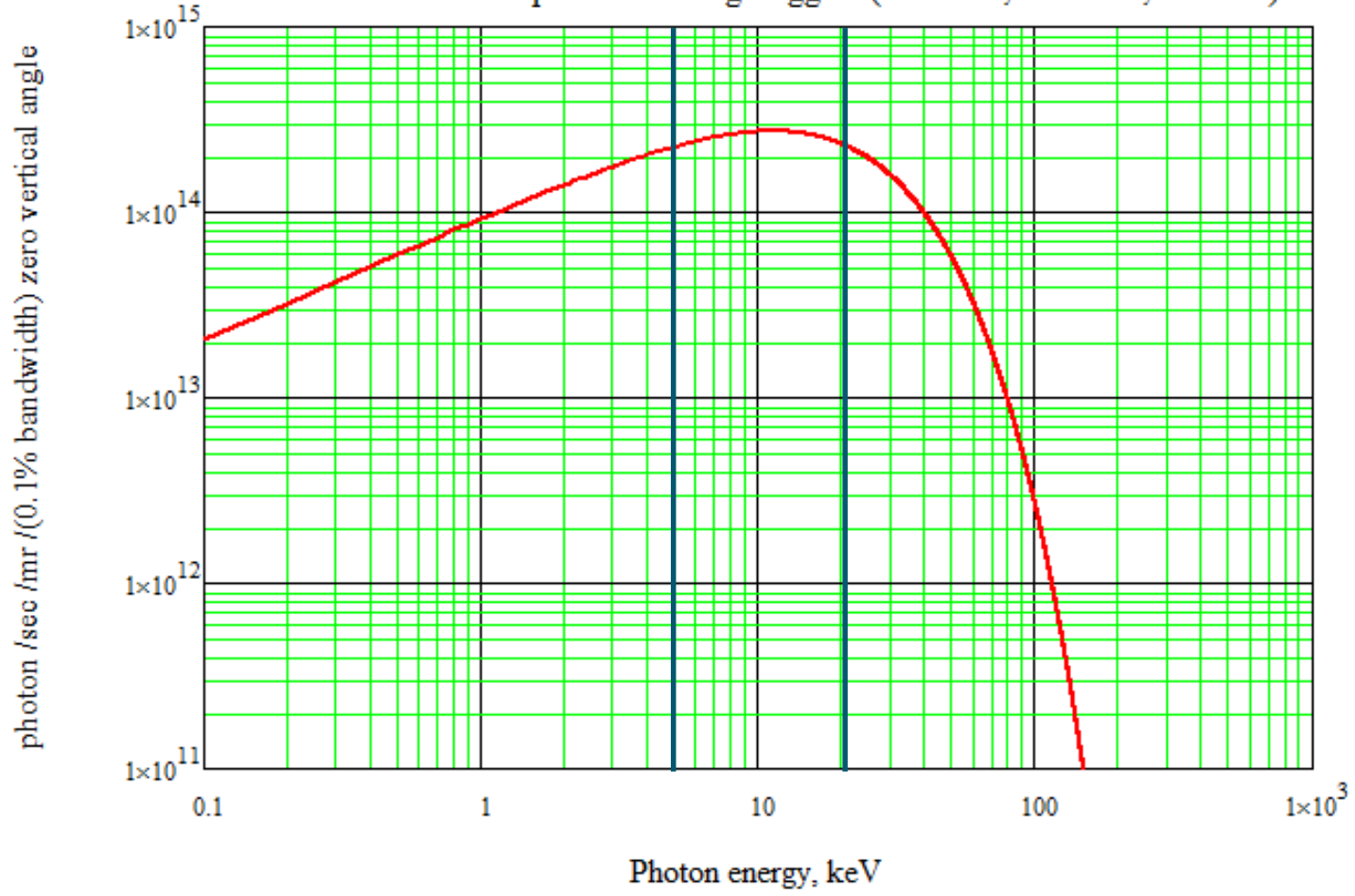
## Source activities

- **Technical dialogue – Budker Institute of Nuclear Physics in Novosibirsk, Russia**
- **Conceptual design report (BINP) – 2019**
- **Several rounds of external consultations on technical specification – 2019**
- **Full tender documentation**
- **Tender offer submitted by BINP – June 2020**



# Super-Conducting Wiggler for energy 5-20 keV

Photon flux from superconducting wiggler (L=1.6m, B=4.5T, I=0.4A)



**B = 4.5T**  
**Period = 51.4mm**  
**Flux = (2-3)\*10<sup>14</sup> ph/s/mrad/0.1%**

— E=1.5 GeV



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- Superconducting wiggler tender
- **JINR beamlines**



## Beamline activities

- **Technical dialogue**
  - FMB Oxford Ltd. (UK)
  - IRELEC (France)
  - AXILON (Germany)
- **Modeling the X-ray optics using ray-tracing procedure**

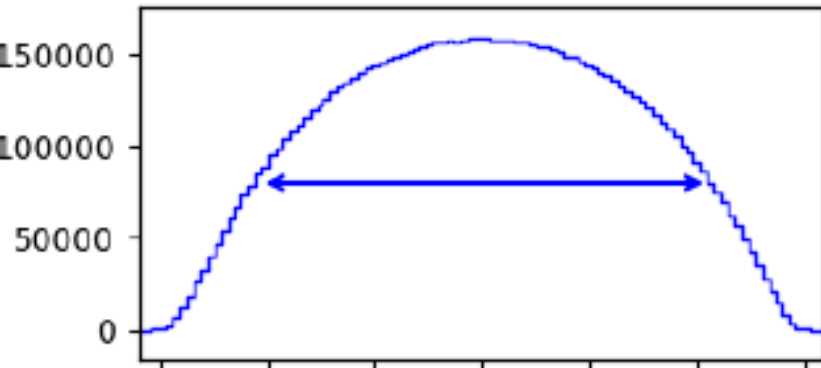
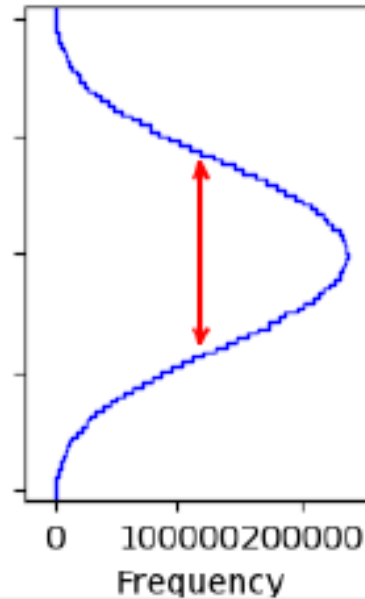
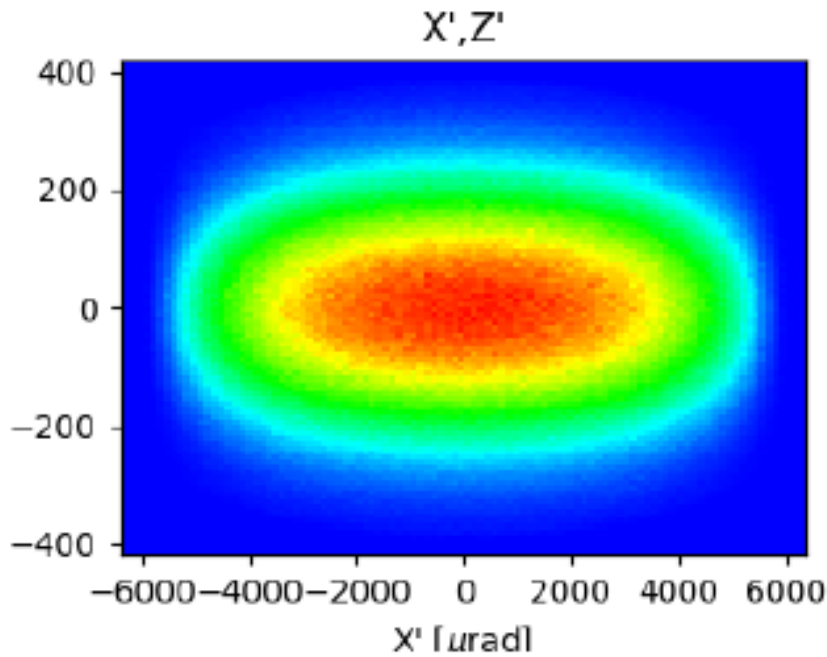


## Front end

- It will be designed to accept the full beam from the Wiggler
- It will deliver a fixed aperture beam into the beamline
- It will be simplified to let out a single beam  $\sim 2$  mrad wide and 0.5 mrad high



# JINR beamline – beam



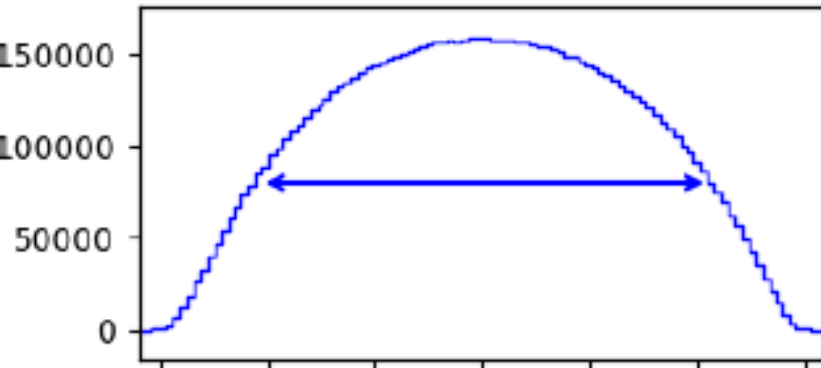
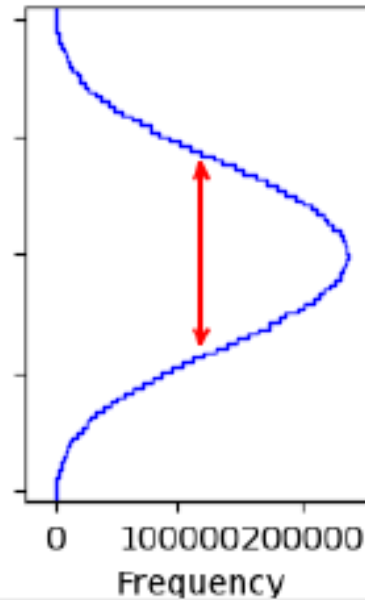
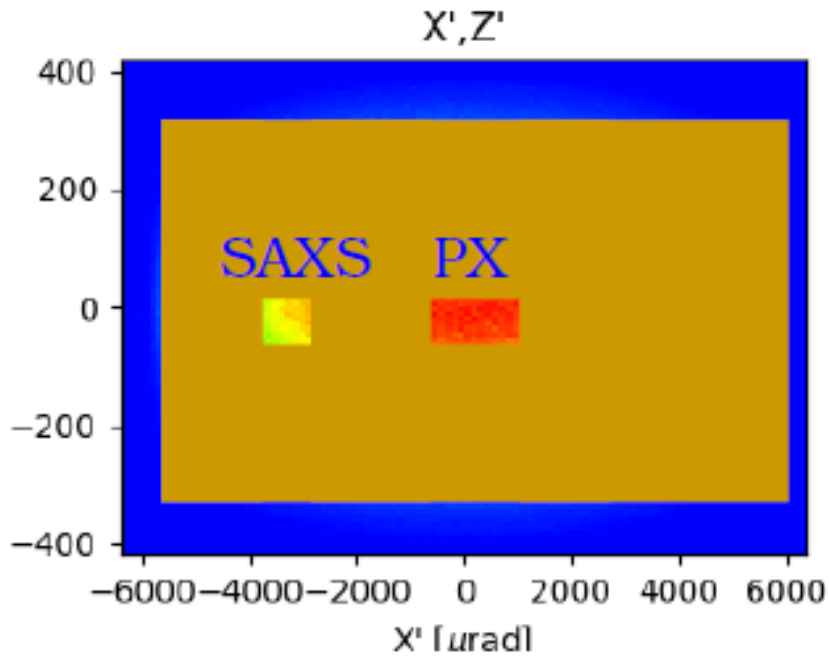
Intensity	0000000.000
Total Rays	10000000
Total Good Rays	10000000
Total Lost Rays	0
FWHM X' [ $\mu$ rad]	8428.0712
FWHM Z' [ $\mu$ rad]	342.5891







# Beamline splitting

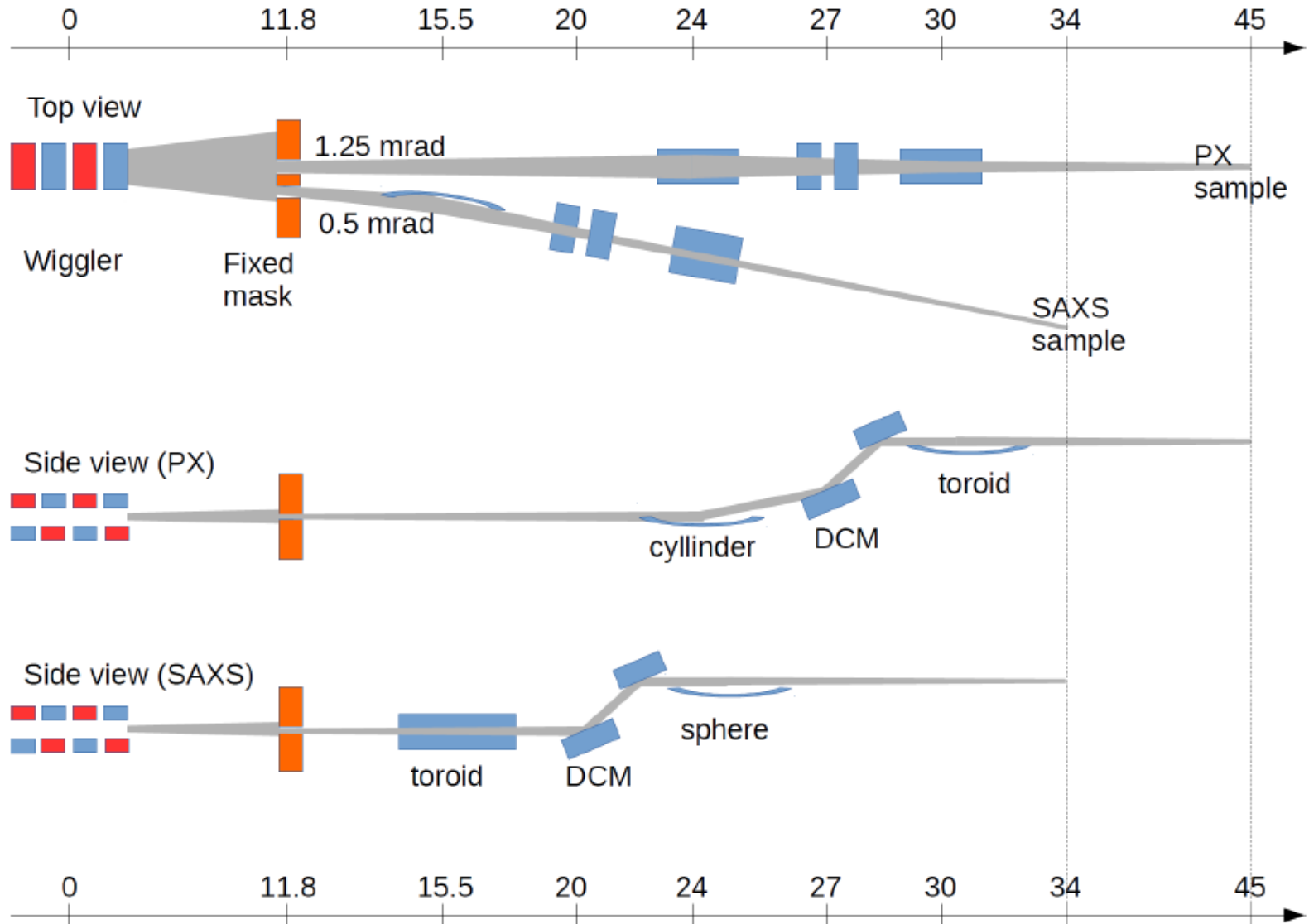


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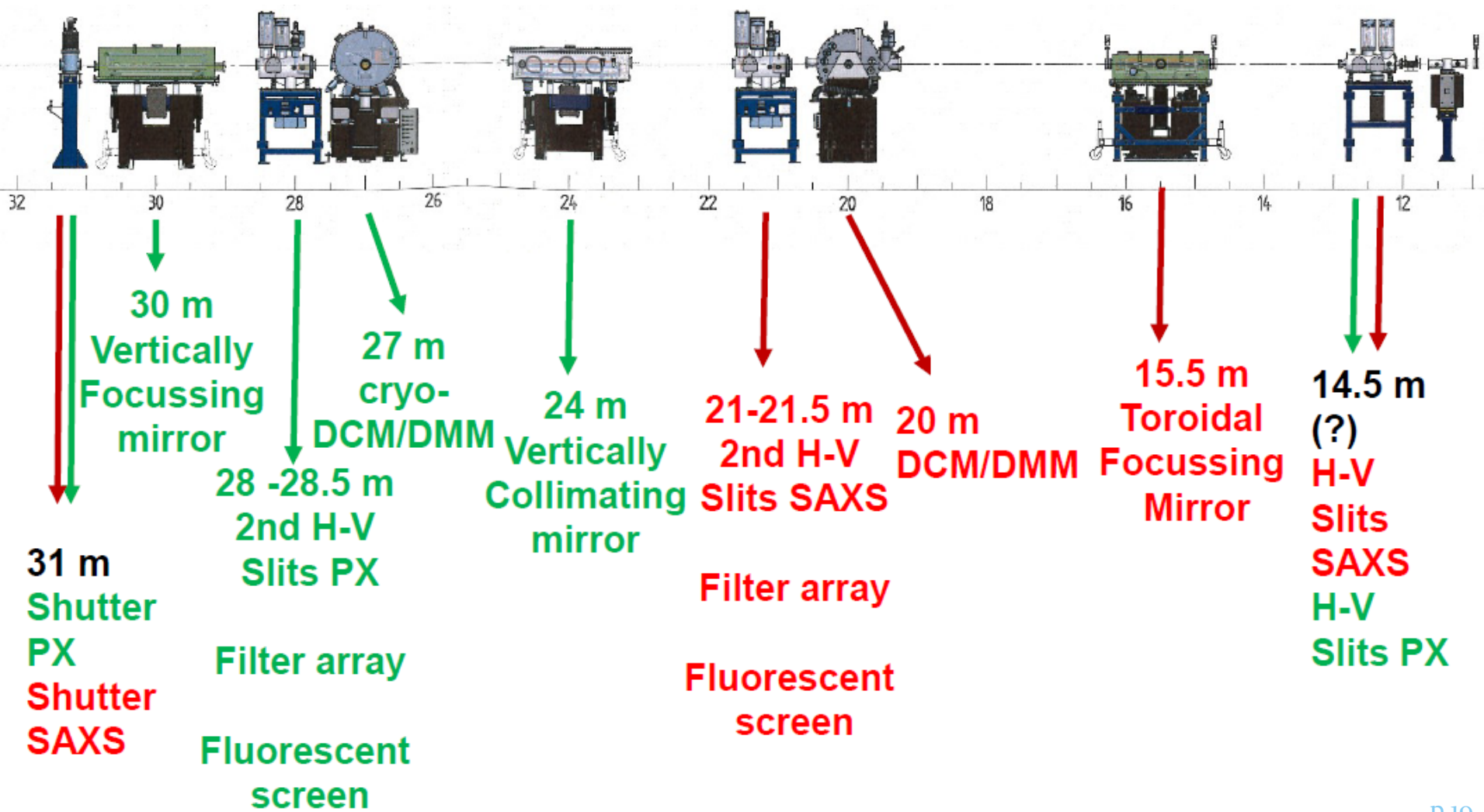


# Beamlines conceptual design





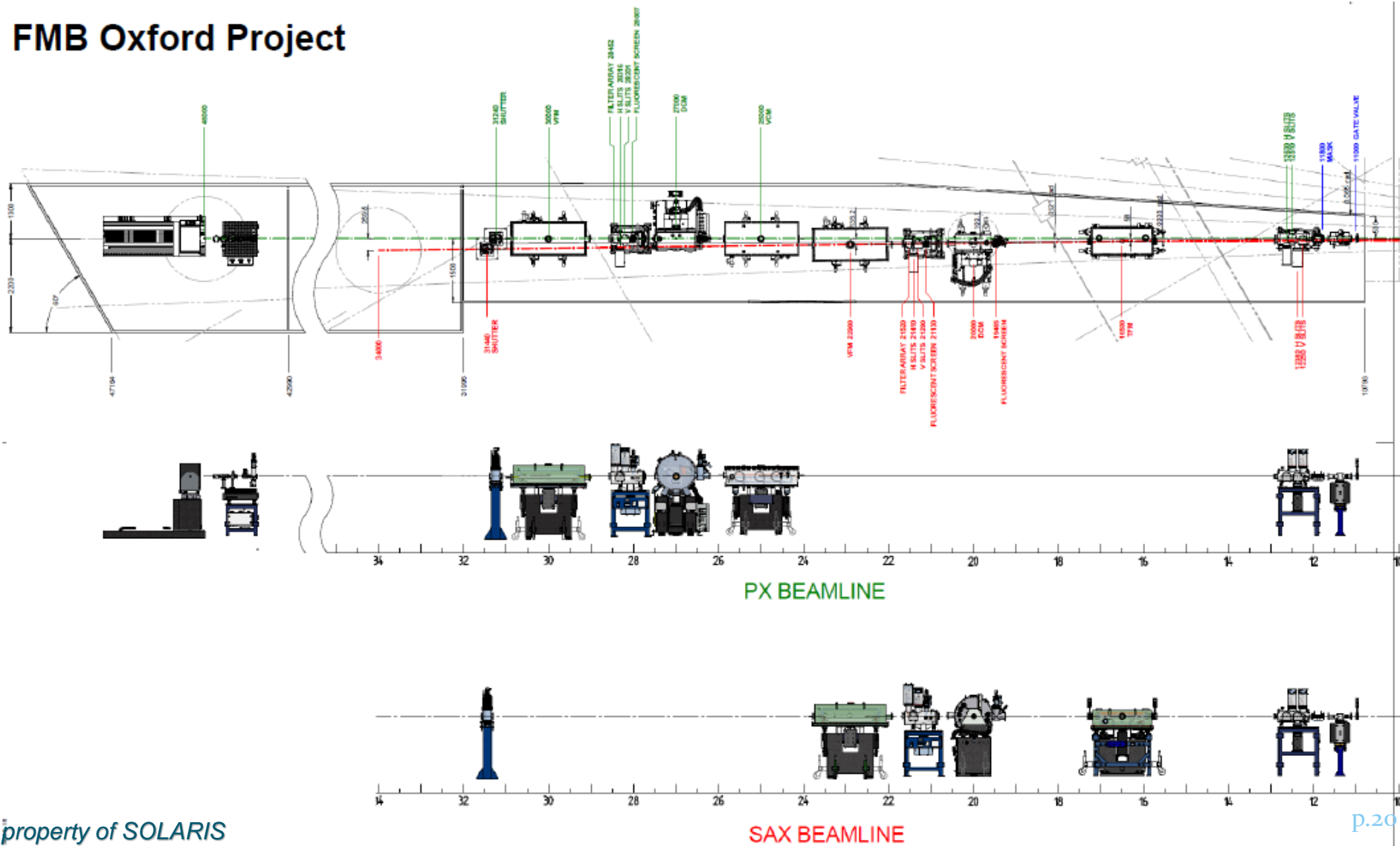
# Optical layout





# Beam lines separation problems

## FMB Oxford Project





# Summary

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- **Building extension design**
- **Superconducting wiggler tender**
- **JINR beamlines conceptual design**



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FOR NUCLEAR RESEARCH



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NATIONAL SYNCHROTRON  
RADIATION CENTRE

Frank Laboratory of Neutron Physics  
Лаборатория нейтронной физики им. ИМ. Франка

FLNP



SOLARIS  
NATIONAL SYNCHROTRON  
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JAGIELLONIAN  
UNIVERSITY  
IN KRAKOW

Thank You  
for Your Attention!

