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PolyX beamline at SOLARIS National Synchrotron Centre - current status

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A new synchrotron multi-purpose beamline PolyX has been constructed at the SOLARIS National Synchrotron Radiation Centre [1] in Krakow. The Solaris 1.5 GeV electron storage ring and has a critical energy of ~ 2 keV. PolyX is a bending magnet based beamline that provides white or monochromatic X-rays in the 4-15 keV range achieved with a hybrid double multilayer/Si(111) monochromator. The end-station is intended mainly for the spectrometry experiments with X-ray microbeam (μ -XRF, μ -XRF, confocal-XRF, μ -XAS, μ -XRD) as well as for micro-tomography in absorption and phase contrast. It is designed to enable experiments in air/helium atmosphere with scanning area up to 90×170 mm² and to provide the capability of fast and easy switching between different measurement modes. The beam focusing is achieved by polycapillary lenses (6-100 μ m FWHM @ 15 keV) and Achromatic Ellipsoidal

X-ray Mirror Lens (below 5 μ m FWHM). Furthermore, the newly established submicron resolution plenoptic X-ray microscopy [2] with 3D imaging capabilities will be accessible for users. The white-beam commissioning has been performed in the third quarter of 2022 [3] and the monochromator has been commissioned in the second quarter of 2023. The beamline will be open for the first users (in the expert commissioning mode) in autumn 2023 and is expected to be fully operational in spring 2024 [4]. During the presentation the beamline design and recent status will be shown and the plan for future developments and upgrades will be discussed.

References

- [1] The European Physical Journal Plus (2023) 138:10
- [2] Applied Physics Letters 116 (1), 2020, 014103
- [3] Nuclear Instruments and Methods in Physics Research B 538 (2023) 131–137
- [4] https://synchrotron.uj.edu.pl/en_GB/linie-badawcze/polyx

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