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Mogno –a high-throughput micro and nanotomography beamline at Sirius, the new Brazilian Synchrotron Ligth Source

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The Brazilian Synchrotron Light Laboratory (LNLS) is currently engaged in the construction and development of Sirius, the largest and most complex scientific infrastructure ever built in Brazil and one of the first 4thgeneration Synchrotron Light Sources in the World. Its ultra-low emittance (0.28 nm.rad) and high brightness will allow the execution of very competitive experiments, opening new perspectives for research in many different fields, including material science, nanoscience, physics, earth and environmental science. MOGNO is being designed to be a world-leading micro/nano imaging beamline focused towards multi-scale analysis (resolution ranging from hundreds of nanometers to dozens of micrometers) of the internal 3D structures of different materials and objects. The beamline will be primarily devoted and specialized in zoomtomography, where a specimen can be studied at low and high-resolution. In parallel, MOGNO competences will be extended to 4D imaging through in-situ experiments, which will allow the researchers to observe and quantify material responses during mechanical, thermal or chemical loadings, in real time. The goal is to obtain full resolution scan times in the order of 1 to 5 seconds. This can be achieved given the extremely high flux provided by a 3.2T bending magnet, the well design optical system and improvements in detection efficiency, as evident in direct detection devices. Overall, all the processes (from robotic arms for sample exchanges, automatic alignment, data post-processing - reconstruction, segmentation and quantitative data analysis), are being optimized to make Mogno a high-throughput beamline.

References

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