Cateretê, the Coherent Scattering Beamline at Sirius, 4th Generation Brazilian Synchrotron Facility

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The Cateretê beamline at Sirius, the new Brazilian synchrotron light source will be dedicated to coherent and time-resolved scattering experiments. It will provide unique capabilities, providing cutting edge research tools that are non-existent today in Brazil, like 3D imaging with nanometer resolution and X-ray photon correlation spectroscopy (XPCS) to study dynamics in hard and soft condensed matter and biological materials.

The SIRIUS storage ring will have a natural horizontal emittance of ϵ_x = 245 $pm\ rad$ and a vertical emittance (coupling 1%) of ϵ_y = 2.4 $pm\ rad$[1]. The Cateretê beamline will be equipped with a Delta undulator[2] allowing to tune the beam polarisation. The main three optical elements, vertical and horizontal focusing mirrors[3] and the four-crystal monochromator will be in a horizontal side-bounce configuration, optimising the stability, and delivering a fully coherent beam of 30 x 30 μm^2, with an energy ranging from 4 to 21 keV. The expected coherent flux is expected to reach 10^{12} ph/s at 4 keV. The experimental station will be located 88 meters from the source, followed by a 28 meters vacuum chamber hosting the Medipix (3k x 3k pixels^2) in-vacuum detector. The sample environment is under commissioning and will enable to perform 3D-CDI, ptychography, BraggCDI and XPCS measurements. It will be equipped with an interferometry system, a cryogenic device for biological specimens and catalytic reactors for *in situ* studies[4,5].

In this poster presentation, I will present the main characteristics and new scientific potentialities of the Cateretê beamline which is expected to receive light by the end of 2019.

References

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