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Hard X-ray micro-tomography at the Spanish Synchrotron Alba

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ALBA is a third generation 3-GeV synchrotron radiation facility built near Barcelona. Since 2012, it serves worldwide academic and industrial users. At the present day its portfolio includes nine operating beamlines, with an additional five, one that will soon enter into operation, and four that are in the design/construction phases, that will expand its capabilities. Among these new beamlines, one is a micro-tomography beamline, the BL31-FAXTOR, which is currently under construction. The beamline will serve different communities, including material science, biomedical, paleontology, earth science, cultural heritage etc.
FaXToR - Fast X-ray Tomography & Radiography beamline, will provide users with beams with an energy range between ~10 keV and ~70 keV. The maximum achievable beam size expected is 35×12 mm2 (HxV) at the entrance of the sample, which is located at 35 m from the source. The beamline will be fed by a short in-vacuum multipole wiggler with an expected flux of ~6x1013ph/s/0.1%BW at 30 keV (250 mA storage ring current). Users will have the possibility of working in the end-station with both a filtered white beam and a beam obtained from a Double Multilayer Monochromator. At the start of operations, the spatial resolution (in terms of image pixel size) will range between ~0.5 µm and ~10 µm, thanks to the presence of different detection systems. The design of the endstation allows the possibility of acquiring imaging simultaneously at two different spatial resolutions if required. The possibility of performing dynamical studies with a temporal resolution < 1 s (per tomography) is foreseen. Both phase-contrast imaging (laplacian and differential) and absorption-based imaging techniques in radiography and tomography modes will be accessible during the experiments. The beamline is expected to present a high data throughput and will use state-of-the-art CMOS fast detectors, therefore particular care is required in order to cope with the computing requirements.

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No

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