In situ DFXM at ID01

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We present in-situ work reaching from minutes down to the sub nanosecond scale carried out using the Dark Field X-ray Microscopy instrument on the ID01 beamline at the ESRF. This instrument is complementary to the one proposed at ID06 (future ID03), for several reasons. First, it diffracts in the horizontal scattering plane, with a maximum detector-sample distance of 6.5 m and a maximum 2θ angle of 95°. Second, it operates primarily in the Bragg (reflection) diffraction geometry at either 8 keV (Be CRL) or 19.7 keV (SU-8 CRL). More importantly, it focuses on in situ experiments involving predominantly semiconductor materials through the extensive collaborations with researchers at the CEA-Grenoble and across Europe. After a quick introduction to the characteristics of the instrument, we shall briefly present results on, 1) in situ annealing of Si TSV and of bonded wafer, 2) in situ cryogenic cooling of HgCdTe IR sensor, 3) in situ electric biasing of halide perovskite, 4) in situ electrochemistry of Li-ion batteries with Si anode, 5) time resolved imaging of surface acoustic wave.

References

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