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X-ray Imaging Detector for X-ray Free-Electron Lasers (XFELs) and Diffraction Limited Storage Rings (DLSRs)

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X-ray Free-Electron Lasers (XFELs) are now bringing new opportunities in coherent X-ray Science (CXS). Future X-ray sources such as high-repetition XFELs and Diffraction Limited Storage Rings (DLSRs) are anticipated to advance CXS further by delivering higher repetition rate and higher brilliance of coherent X-ray beam. In this talk, we first review the detector development for XFELs [1] with an emphasis of physical and technology limitation. Then we try to outlook the future opportunities from the viewpoint of X-ray imaging detectors. As a concrete example, we will describe the target performance of the detector for upgraded SPring-8 facility with a continuous frame rate of 20 kHz, and a few 10 ns time resolution in burst mode [2].

References

- [1] T. Hatsui and H. Graafsma, "X-ray imaging detectors for synchrotron and XFEL sources", IUCrJ, Vol. 2, p371.
- [2] SPring-8-II Conceptual Design Report, <http://rsc.riken.jp/pdf/SPring-8-II.pdf>

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