

X-ray diffraction using the ESRF-EBS

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Atomic structures can be determined using X-ray diffraction and this technique has already had a huge impact on a wide range of scientific disciplines. The upgrade of the ESRF source will bring another order of magnitude increase in the X-ray flux available for diffraction experiments in many beamlines. Detector upgrades are also planned in order to get the full benefit of these source improvements.

In many cases, these upgrades will increase the range of samples for which we can obtain atomic information, to ever smaller crystals and also with higher resolution in time and space. There are a range of new techniques available where we can obtain images of samples by scanning small beams while recording X-ray diffraction data. The EBS upgrade will enable these very demanding methods to be used for in-situ studies, so that we will be able to see what the atoms are doing inside of complex materials and evolving micro-structures. Examples of recent highlights from ESRF will be presented with a view towards the new possibilities planned for 2020.

Primary author: Dr WRIGHT, Jonathan (ESRF)

Presenter: Dr WRIGHT, Jonathan (ESRF)

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