MS39-P9 Current status of the liquid-metal-jet X-ray source technology

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High-end x-ray diffraction and scattering techniques such as high-resolution XRD, protein crystallography, and SAXS rely heavily on the x-ray source brightness for resolution and exposure time. Traditional solid or rotating anode x-ray tubes are typically limited in brightness by when the e-beam power density melts the anode. The liquid-metal-jet technology has overcome this limitation by using an anode that is already in the molten state.

We have previously demonstrated prototype performance of a metal-jet anode x-ray source concept [1-3] with unprecedented brightness in the range of one order of magnitude above current state-of-the art sources. Over the last years, the MetalJet technology has developed from prototypes into fully operational and stable X-ray tubes running in many labs over the world.

This presentation will review the current status of the technology specifically in terms of stability, lifetime, flux and brightness. It will also discuss details of the liquid-metal-jet technology with a focus on the fundamental limitations of the technology. It will furthermore refer to some recent data from applications within x-ray diffraction and SAXS.

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MS39-P10 Software solutions for custom-built X-ray diffractometers and non-standard experimental setups

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Commercially produced X-ray diffractometers are widely available and supplied with all the required software to plan, carry out and process data from routine experiments. However, they can be inadequate for experiments which require specialised sample environments *e.g.* photo-crystallography and other in-situ measurements, and there can be delays before certain hardware like pixel detectors become available. It is therefore sometimes necessary to build an instrument from scratch or modify an existing one which not only involves assembly of mechanical parts but also electronic synchronisation and software to coordinate the whole instrument and control the related experiment. Because parts are from different manufacturers it is very often challenging to write the software controlling the new instrument and fit the process in an existing workflow for data processing.

We present here different software which have been used in the Laboratoire de Cristallographie, Résonance Magnétique et Modélisations at université de Lorraine, Fr and the I19 beamline at the Diamond Light Source, Uk for instrument control, strategy and data processing.

Keywords: Software, X-ray intruments, Computer programming