

## Upbl 11 extreme condition xas beamline

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In the last decades, we have witnessed an unprecedented surge in high-pressure research that has greatly improved our fundamental understanding of materials under high compression. The X-ray investigation of matter under extreme conditions has become one of the major activities at 3rd generation synchrotron sources. The array of techniques that was initially restricted to structural measurements using X-Ray diffraction is now extended to include many other X-ray techniques such as IXS, NIS, EXAFS, XMCD, X-ray Compton scattering and X-ray magnetic scattering. As a direct consequence, extreme conditions science was naturally selected as one of the major themes of the ESRF Upgrade Programme. Advanced, dedicated experimental stations, using high-brightness X-rays with tightly focused beams and equipped with state-of-the-art pressure cells, will enable the study of materials over a range of pressures and temperatures which was previously not accessible. The Upgrade Programme BeamLine 11 facility overcomes the limitations of the old ID24 beamline [1] and provides a world-wide unique beamline for Energy Dispersive X ray Absorption Spectroscopy (EDXAS) in terms of spot size ( $3 \times 3 \mu\text{m}^2$  at FWHM), single shot time resolution (microseconds) and energy range (5-28 keV). Indeed the EDXAS<sub>S</sub> ("small spot") branch of UPBL11 combined with the standard EXAFS bending magnet station BM23 (transfer of ESRF beamline 23) will be the first beamline in the world able to perform high-pressure X-ray absorption experiments with a resolution of 100 nm and a time resolution of 100 microseconds.

In this contribution, I will describe the first experiments carried out during the commissioning of the new facility and give some preliminary results.

References 1. S. Pascarelli, O. Mathon, M. Munoz, T. Mairs and J. Susini, Journal of Synchrotron Radiation 13, 351 (2006). 2. A. Filippioni, M. Borowski, D. T. Bowron, S. Ansell, S. De Panfilis, A. Di Cicco, and J.-P. Itie, Rev. Sci. Instruments, 71(6), 2422-2432 (2000); A. Filippioni, V.M. Giordano, S. De Panfilis, A. Di Cicco, E. Principi, A. Trapananti, M. Borowski and J.-P. Itie, Rev. Sci. Instruments, 74(5), 2654-2663 (2003).