

Status of XES spectrometer at Balder beamline at MAX IV

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Balder is a wiggler beamline dedicated to X-ray absorption spectroscopy (XAS) and X-ray emission spectroscopy (XES) in medium and hard X-ray energy range 2.4-40 keV [1]. Our aim is to reach a high repetition rate down to 1s for full EXAFS in order to preserve the sample (reduce radiation damage) and attain redox dynamics in *in-situ* reactions. The beamline is in the user operation and under expansion of the instrumentation portfolio.

In the first part of the talk I describe the beamline and demonstrate the achieved XAS data quality. I also show the presence of undulator features in the wiggler spectrum, characteristic of low emittance storage rings.

The second part of the talk is devoted to our XES spectrometer of the 1D Johansson type [2]. I present the design, discuss major decisions, technical restrictions and the crystal technology. One of our 18 silicon crystals is shown in Figure 1.

At the time of writing this abstract we have had four days of the very first commissioning time of the spectrometer. By the time of the Workshop we will have had a few more commissioning days and hopefully some presentable spectroscopic results.



Figure 1: A ground-bent silicon crystal mounted on an aluminum support. The surface radius is 750 mm while the atomic planes are curved with a double radius. The crystal thickness is 300 μm , the working surface is 300 mm \times 38 mm.

References

- [1] - K. Klementiev, K. Norén, S. Carlson, K. Sigfridsson Clauss and I. Persson, 2016 *The BALDER Beamline at the MAX IV Laboratory*, J. Phys.: Conf. Ser. **712** 012018.
- [2] - Klementiev, I. Preda, S. Carlson, K. Sigfridsson and K. Norén, 2015 *High performance emission spectrometer at Balder/MAXIV beamline*, J. Phys.: Conf. Ser. **712** 012018.