The Hard X-ray Nanoprobe Beamline at MAX IV Instrumentation and First Results

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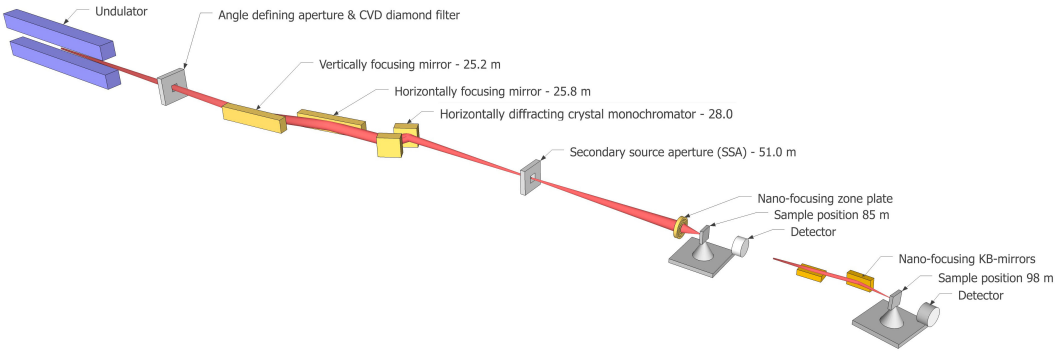
NanoMAX is the first X-ray imaging beamline at the new Swedish synchrotron radiation source MAX IV[1] coming into operation. It is a hard X-ray undulator beamline for nano-beams and enables imaging applications exploring diffraction, scattering, fluorescence and coherent diffractive imaging methods.

The beamline features two experimental stations for users. One experimental station using KB-optics, with beamsizes in the 40-200 nm range, well suited for diffractive, fluorescence and coherence experiments in very flexible sample environments. The other experimental station will utilize zone plates to ultimately reach 10 nm resolution using fluorescence, diffraction and coherent imaging methods on nanoscale objects.

The MAX IV multi-bend achromat 3 GeV storage ring is in routine operation for beam delivery and shows excellent performance with 150 mA stored current. The beamline and the KB-station are installed. Commissioning of the experimental station started in April 2017 and basic functionality has been provided for about 15 user experiments until now. We have reached a focus of 40 nm at 24 keV and 90 nm at 10 keV, in line with design values. The FZP-experimental station is currently under design.

We will describe the beamline instrumentation, the two experimental stations and then the achievements from commissioning work and first user experiments[2].



The NanoMAX beamline at MAX IV with main components illustrated.

References

[1] U. Johansson, U. Vogt, A. Mikkelsen, Proc. of SPIE Vol.8851, 88510L (2013)

[2] U. Vogt, K. Parfeniukas, T. Stankevic, S. Kalbfleisch, M. Liebi, Z. Matej, A. Björling, G. Carbone, A. Mikkelsen, and U. Johansson, Proc. of SPIE Vol. 10389, 103890K-1 (2017)