

What to do with a portable von Hámos spectrometer?

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X-ray spectrometers enabling von Hámos geometry [1] are relatively robust and easy to set up. After alignment, full emission and/or energy loss spectra with sub-eV resolution can be acquired without any moving parts and the data are self-normalizing. Consequently, such a spectrometer is well suited for pump-probe or shot-to-shot experiments [2, 3] and is ideal for portable applications [4, 5]. However, they do not reach the extraordinary signal-to-noise ratio of spectrometers in Johann geometry which complicates acquisition of weak signals.

Our portable von Hámos spectrometer utilizes an analyzer array with 4 cylindrically bent crystals having a bending radius of 500 mm together with a Pilatus 100K detector. Both, analyzer array and detector are installed on linear stages for changing the observed energy window and the whole setup can be moved around the sample position on a circular rail. Two spectrometers are available which, in principle, can be installed at any synchrotron beamline. They can be used for stand-alone (two-color) X-ray emission experiments but also in combination with other methods such as e.g. X-ray diffraction or X-ray Raman scattering. Selected examples for experiments performed with these portable spectrometers at different beamlines (P01 at PetraIII, Galaxies at Soleil, BL9 at DELTA) will be discussed.

References

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