

# Inelastic X-Ray Scattering Experiments with Position Sensitive Detectors

Huotari S., Albergamo F., Henriquet C., Graafsma H., Ponchut C., Vankó G., Verbeni R.,  
and Monaco G.

European Synchrotron Radiation Facility, B.P. 220 F-38043 Grenoble CEDEX, France; email:  
gmonaco@esrf.fr

Inelastic X-ray Scattering (IXS) spectrometers designed for high-resolution, non-resonant scattering experiments are based on crystal analysers operated close to backscattering in the Rowland-circle geometry, which allows for simultaneous focusing and energy analysis of the X-rays scattered from a point source. Depending on the resolution that needs to be achieved, elastically bent analyser crystals or diced analysers are used, the latter ones being the only realistic choice when resolutions in the meV energy range are looked for. In this case, the Rowland-circle radius is typically chosen in the 6-8 m range in order to reduce to a minimum the geometrical contribution to the resolution that comes from the analyser dices.

All the IXS spectrometers designed so far make use of point detectors. It will be here shown how it is possible to profit from the development of low-noise, position sensitive detectors to improve the design of IXS spectrometers both in terms of overall size and in terms of efficient use of the scattered radiation. These improved designs have the potentiality to open new perspectives for the IXS technique. Finally, the requirements on the two-dimensional detectors optimised for these applications, and the additional developments needed on the existing ones, will be discussed.