

Recent progress in development of high energy in-line refractive and diffractive optics at the ESRF

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Salle RdC du Pavillon d'Accueil

Séminaires

The presentation is intended to review the most recent developments of hard X-ray in-line optics with main emphasis on the performance of Fresnel zone plates (FZP) and compound refractive lenses (CRL). Both types are capable of generating micro- and nano-focus beams. As on-axis optics, CRL and FZP do not change the direction of X-ray beam. They are small, easy to align and operate. They can be easily incorporated at almost any beamline providing a microbeam option. The most illustrative examples are ID1, ID10 and ID32 beamlines where FZP elements were successfully used for microdiffraction experiments. New microfocusing capabilities using flexible refractive lenses have been implemented on ID11, ID15 and ID22/18F allowing to obtain microfocus beams up to 200 keV. The CRL focal length and spot size is adjustable by adding or removing individual lenses that beam properties can easily be adapted to wide range of high resolution diffraction and scattering experiments including SAXS (ID13, ID18F), surface-sensitive diffraction (ID15) and standing wave techniques (ID22). Advances in microfabrication technology extend the list of available lens materials to Si, diamond, different metals and plastics permitting fabrication of large aperture and high aspect-ratio diffractive-refractive elements for beam conditioning as microradian collimators (ID18) and condensers (ID13). Giant FZPs of millimeters acceptance were recently installed at ID1 as pre-focusing optics being in competition with curved mirrors/crystals. A stacking FZP technique developed recently at the ESRF allows to use medium resolution Si FZP elements up to 60 keV energy. New class of refractive-diffractive lenses made for example from diamond can cope with the heatload of present undulators and future XFEL sources.

Formalités d'entrée : accès libre dans l'amphi du Pavillon d'Accueil. Si la manifestation a lieu dans le Grand Amphi Soleil du Batiment Central, merci de vous munir d'une pièce d'identité et de prévenir le secrétariat en charge de l'événement.

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