

Time-resolved imaging at synchrotrons and at free electron lasers: challenges and opportunities

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Amphithéâtre SOLEIL

The recent advent of diffraction-limited synchrotron light sources and of free electron lasers (FELs) has been a breakthrough for x-ray science, with experiments which were only a few years ago thought to be out of reach, now becoming a reality. In the field of x-ray imaging, both types of facility greatly improve the maximum spatial resolution achievable, aiming at the sub-10 nm range in the soft x-ray range. X-ray FELs in addition also allow for simultaneous femtosecond temporal resolution. Time-resolved imaging is particularly challenging because many images need to be recorded almost parallel, in order to minimise the effect of drift.

In this talk, I will review the state-of-the-art of x-ray imaging at both facilities. I will discuss the current status of time-resolved imaging at synchrotrons, including experiments performed with the machine running in low-alpha mode, i.e. with shorter bunches aimed at improving the temporal resolution. I will also discuss the very recent experiments at the European XFEL, the first FEL based on a superconducting accelerator, which allows for high-repetition rate experiments, with two-three orders of magnitude higher average photon flux as compared to the warm linac machines. I will focus on imaging of magnetic solid state samples, because of the relatively large number of experiments, but the conclusions will be valid in general also for non-magnetic systems.



Ce séminaire sera suivi d'une pause café

Formalités d'entrée : accès libre dans l'amphi du pavillon d'Accueil.

Si la manifestation a lieu dans le Grand Amphi SOLEIL du Bâtiment Central merci de vous munir d'une pièce d'identité (à échanger à l'accueil contre un badge d'accès)

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