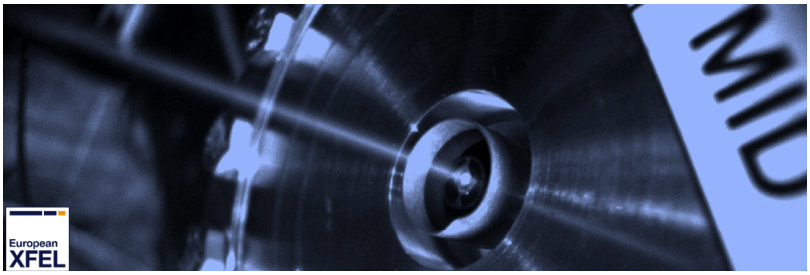

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Accuracy and limitations of XFEL structure determination inferred from X-ray pump X-ray probe studies

Thursday 19 January 2023 18:21 (7 minutes)

Understanding intense XFEL interaction with matter is essential not only because of fundamental interest but also for interpreting experimental results. This presentation reviews recent experimental studies on intense x-ray interaction with matter using unique operation modes at SACLA (twin XFEL mode [1] and self-seeding mode [2]).
In particular, I will focus on XFEL-induced femtosecond structural and electronic changes in crystalline materials [3-6] revealed by X-ray pump X-ray probe techniques. Based on the experimental results, I will discuss the accuracy and limitations of structure determination with intense XFEL pulses.
[1] T. Hara *et al.*, *Nature Commun.* 4, 2919 (2013).
[2] I. Inoue *et al.*, *Nature Photon.* 13, 319 (2019).
[3] I. Inoue *et al.*, *PNAS* 113, 1492 (2016).
[4] I. Inoue *et al.*, *PRL* 126, 117403 (2021).
[5] I. Inoue *et al.*, *PRL* 128, 223204 (2022).
[6] I. Inoue, J. Yamada, B. Ziaja *et al.*, *in preparation.*

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