

Summary of round-table discussions

Breakout session discussion

2A: XFEL experiments with synchronized optical lasers organized by H. Itoh and N. Kida

First, as SACLA's synchronized optical laser facility up-date, pump-and-probe spectroscopy systems by using strong-electric-field terahertz pulses and 8 fs near-infrared laser pulses are reviewed.

Next, three (potential) users introduced their latest pump-and-probe experiments. Prof. T. Ishikawa (Inst. Sci. Tokyo) described comprehensive optical and electron diffraction studies on local structural changes in spin crossover systems and expressed to use XFEL to detect ultrafast bond dynamics in the future. Next, Prof. H. Wadati (Univ. Hyogo) introduced his research concerning the ultrafast change of magnetic states by time-resolved X-ray absorption spectroscopy. The change in the valence state of rare earth ions upon photoexcitation was successfully detected. In the future, he expected to control magnetization using the magnetic-field component of strong-electric-field terahertz pulses. Finally, Prof. H. Itoh (Kwansei Gakuin Univ.) reported recent activities on terahertz pump-and visible-probe experiments: he reported that terahertz electric field induces ultrafast changes of the electric polarization in electronic-type ferroelectrics, and expressed for domain-imaging experiments using XFEL.

In the round-table discussions, we discussed future prospects on XFEL experiments with synchronized optical lasers; for examples, domain imaging by speckle and nano-focusing techniques, optimization of terahertz pump and X-ray probe spectroscopy, and terahertz polarization control. We have 17 participants in this session.