ABSTRACT
An X-ray free electron laser (XFEL) which delivers brilliant, transversely coherent, and extremely short pulses is a powerful tool for carrying out ultrafast study in many disciplines including physics, chemistry, biology, material, and etc. However, realizing its full potential usually is difficult without characterization, control, and data processing because XFEL pulses exhibit stochastic fluctuations in all physical attributes of the beam since it originates from the shot noise in the electron bunch during the self-amplified spontaneous emission (SASE) process. Pohang Accelerator Laboratory X-ray Free Electron Laser (PAL-XFEL) provides optimized experimental conditions for optical laser pump and XFEL probe experiments with remarkably stable XFEL pulses which have world recording minimal temporal jitters. I will introduce the recent progress of research regarding ultrafast dynamics performed at PAL-XFEL.