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Development of experimental platform for high energy density sciences using high-intensity optical lasers at the SACLA x-ray free electron laser facility TOSHINORI YABUUCHI, MAKINA YABASHI, RIKEN SPring-8 Center, YUICHI INUBUSHI, AKIRA KON, TADASHI TOGASHI, HIROMITSU TOMIZAWA, JASRI — Combinations of high intensity optical laser and x-ray free electron laser (XFEL) open new frontiers in high energy density (HED) sciences. An experimental platform equipped with high-power Ti:Sapphire laser systems is under commissioning for HED sciences at the XFEL facility, SACLA. The Ti:Sapphire laser system is designed to deliver two laser beams with a maximum power of 500 TW in each to the sample chamber. A hard x-ray beamline of SACLA is also transported to the chamber with a beam focusing capability down to a few microns using sets of compound refractive lenses. The second optical laser pulse or the energetic particles and photons generated by the laser pulse can provide additional flexibilities for HED-related pump-probe experiments, which have been generally performed using single optical laser and XFEL. The development status and future perspectives of the experimental platform will be presented.

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