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New Research Opportunities with PAL-XFEL Facility

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PAL-XFEL project is aiming to produce 0.1 nm coherent X-ray laser to photon beam users. In order to produce such photons, there are 10-GeV electron linac based on S-band normal conducting accelerating structures and a 150-m long out-vacuum undulator system. The project was started in April 2011, and the 1.11 km-long building was completed in February 2015. The installation of 10-GeV linac, undulator systems, and beamlines has been completed by the end of 2015. The operation permit was issued on April 12, 2016, and the beam commissioning was started immediately. On April 25, the linac has achieved to accelerate 10-GeV electron beams from RF photocathode electron gun. By November 2016, the commissioning has reached to obtain 0.15 nm lasing. Further improvements about the photon intensity and the beam stability are under purse. In this talk, the details of constructions and commissionings will be introduced. Potential applications of ultra-short pulsed, coherent X-rays will be introduced with the emphasis on the structural molecular biology and the ultra-fast chemical dynamics in the range of femtoseconds.