

ESTABLISHMENT OF THE FIRST ACCELERATOR-BASED INFRARED FREE-ELECTRON LASER FACILITY IN SOUTHEAST ASIA

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An accelerator-based mid-infrared (MIR) and terahertz (THz) free-electron laser facility is recently established at the PBP-CMU Electron Linac Laboratory (PCELL) of the Plasma and Beam Physics Research Facility in Chiang Mai University, Thailand. This project was officially launched in 2019 and planned to be ready for applications in late of 2022. This new facility will be the first of its kind in Thailand and Southeast Asia. The major parts of the 25-MeV electron accelerator and the free-electron laser beamlines have been designed and developed in-house by our group. The system consists of a thermionic radio-frequency radio-frequency (RF) electron gun, a pre-bunch compressor in a form of alpha magnet, an S-band RF linear accelerator, two magnetic bunch compressors, and two undulator magnets for generation of the MIR oscillator free-electron laser and the coherent THz radiation. Development of experimental stations using THz time-domain spectroscopy and pump-probe experiment is proceeded. The ultimate goal of this facility is to become the first user infrared free-electron laser facility in Southeast Asia that opens for all researchers from Thailand and Asian. It will provide experimental stations and advanced tools for frontier researches and applications in material science, biotechnology and medicine. With environment of research university like Chiang Mai University, this facility will also excellently become an academic training centre for students and interested researchers on the fields of electron accelerator and accelerator-based light source. Introduction to the facility and progress report in terms of the facility performance and its experimental stations will be presented in this contribution.

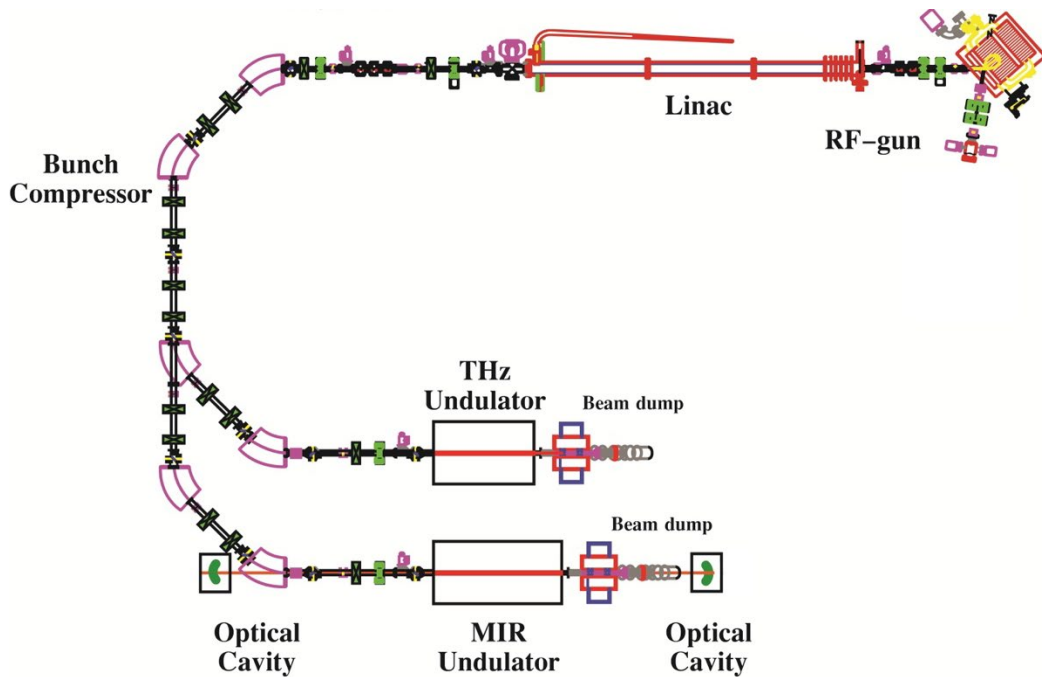


FIG. 1. Schematic layout of the 25-MeV electron accelerator system and MIR-THz free electron laser beamlines at Chiang Mai University in Thailand.