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Development of Linac-based MIR/THz Free-electron Laser Facility in Thailand

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A linac-based MIR/THz free-electron laser facility is under the development at the Plasma and Beam Physics Research Facility, Chiang Mai University. The ultimate goal of the project is to generate the infrared radiation covering wavelengths from about 10 to 125 micron. The main applications of the radiation in this wavelength range involve MIR/THz imaging and spectroscopy. The future FEL facility will consists of an injector system, an experimental station for coherent transition radiation, two magnetic bunch compressors and two undulator magnets and their corresponding optical cavities for generation of MIR and THz FELs. The injector system combines an RF-gun, an alpha magnet, a travelling-wave linac structure and other associated components. The magnetic bunch compressors compress the electron bunches to have a bunch length in the ps regime with energy spread preservation. An expected electron beam energy is between 10 to 20 MeV. Two undulator magnets with maximum undulator parameters of 1 and 0.95 will be used for THz-FEL and MIR-FEL, respectively. In this paper, we present the status of the design and construction of this future FEL facility.

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