

# Modeling and simulations of the permanent undulator magnet for generation of MIR-FEL

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This research focuses on computer modeling and magnetic field simulations of a permanent undulator magnet at the Plasma and Beam Physics Research Facility, Chiang Mai University. This undulator magnet will be used for generation of the mid infrared free electron laser (MIR-FEL). It has 40 periods with a period length of 40 mm. The magnetic field can be varied by adjusting a gap of the undulator. A maximum magnetic field of 0.29 Tesla, which corresponds to the undulator parameter of 1.08, can be achieved for the undulator gap of 25 mm. The magnetic field simulations were conducted by using computer programs PANDIRA and RADIA for 2D and 3D modeling, respectively. The simulation results from both models are compared and discussed in this paper. The achievement of this study will be used as a significant information for installation and operation of the undulator magnet at our facility.

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