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Performance of terahertz-wave beamlines at Nihon University's laboratory LEBRA

Tuesday 3 June 2025 16:00 (2 hours)

National Institute of Advanced Industrial Science and Technology (AIST) has collaborated with Nihon University to study generation of high-intensity terahertz waves using coherent radiations at the Laboratory for Electron Beam Research and Application (LEBRA) at Nihon University. In a straight section for parametric X-ray (PXR) generation, developments of various types of coherent radiation sources and a study of superimposed coherent radiation using a ring-type resonator have been conducted. Coherent edge radiation (CER) generated in the downstream bending magnet is transported to an experimental room using the PXR beamline and is used for spectroscopic measurements and imaging experiments in an acrylic box filled with dry air. In a straight section for an infrared free-electron laser (FEL), CER generated by a downstream bending magnet during FEL oscillations is extracted from an FEL resonator by a toroidal mirror with a hole.* The extracted CER is reflected by a sapphire substrate coated with Indium-tin oxide and transported to the room using an FEL beamline.
In this presentation, the status of the two THz beamlines at Nihon University's laboratory LEBRA will be described.

Footnotes

*N. Sei et al., "Observation of terahertz coherent edge radiation amplified by infrared free-electron laser oscillations", Sci. Rep. 11, (2021) 3433.

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