

Plan for terahertz-wave source of superimposed coherent transition radiation using ring-type resonator at LEBRA

Thursday 29 August 2024 16:00 (2 hours)

We have studied high-power terahertz-wave sources using a normal-conducting S-band linac at the Laboratory for Electron Beam Research and Application (LEBRA) at Nihon University [1, 2]. The developed coherent transition radiation (CTR) had a high energy of 1 mJ per macropulse [3]. However, the peak power of the CTR was approximately 100 kW and did not reach 1 MW, i.e., the level at which nonlinear optical phenomena are evident in the terahertz region. Therefore, we planned to generate high peak-power terahertz pulses by confining CTR micropulses in a ring-type resonator and superimposing them with CTR micropulses generated late within the resonator. By inserting a substrate with low absorption in the terahertz region into the resonator as an output coupler, it is possible to extract CTR pulses with high peak power while suppressing a cavity loss. In the presentation, we will report on this development plan based on the CTR pulse superimposition with the ring-type resonator at the LEBRA.

Footnotes

1. N. Sei et al., J. Phys. D: Appl. Phys. 46 (2013) 045104.
2. N. Sei et al., Sci Rep. 11 (2021) 3433.
3. N. Sei et al., Jpn. J. Appl. Phys. 56 (2017) 032401.

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