

Efficient handling of THz radiation from relativistic laser interaction with liquid jet

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The generation of THz radiation from relativistic laser-plasma interactions is currently being actively investigated [1, 2]. In this paper, methods for detecting THz radiation obtained in the interaction of a relativistically intense laser pulse with a preionized target – ethanol jet with a thickness of tens of micrometer have been developed. The regime of generation of an electron beam with a large divergence usually corresponds to a higher beam charge, and, subsequently, to a higher energy of transition radiation in the THz frequency range. However, this regime also leads to the generation of THz radiation at wide angles due to the low average electron energy. Therefore, to collimate THz radiation generated at relatively wide angles, we propose to use a special parabolic concentrator with acceptance of angles from 45° to 90°. This study was conducted within the scientific program of the National Center for Physics and Mathematics, section 4. Stage 2023-2025.

[1] Liao G Q and Li Y T 2019 *IEEE Transactions on Plasma Science* **47** 3002–3008

[2] Gorlova D A, Tsymbalov I N, Ivanov K A and Savel'ev A B 2023 *Kvantovaya Elektronika* **53** 259–264