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Compact high peak power THz source driven by thermionic RF gun

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This work unveils the design of a compact high-power terahertz source, a collaborative effort between UCLA and RadiaBeam Technologies. The system, driven by a thermionic RF gun, features an alpha-magnet beamline that effectively compresses the beam, resulting in short bunch lengths and an additional S-band linac that elevates the beam energy to 10 MeV. The key to achieving high-efficiency radiation in the 1–1.5 THz range lies in using the tapered undulator equipped with a waveguide. This innovative approach serves a dual purpose: compensating for diffraction effects and ensuring optimal matching between the group velocity of the beam and the radiation field. The synergistic combination of these elements results in a compact terahertz source with high peak power, promising advancements in various scientific and technological applications.

Footnotes

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North America

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