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## **Study of the laser manipulation on relativistic electron beam for terahertz emission**

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Terahertz radiation plays an important role in cutting-edge scientific research. Terahertz radiation source based on relativistic electron beam can provide excellent terahertz radiation source. The performance of such radiation is closely related to the distribution of the electron beam. Therein, the laser modulation technology based on the undulator is widely used to manipulate the distribution of the electron beam, thereby manipulating the radiation characteristics, such as improving coherence, tuning spectrum and controlling pulse width. In this paper, we analytically discuss the effects of various non-ideal factors during the process of dual-laser difference frequency modulation, such as finite laser pulse width, laser frequency chirp, and electron beam phase space distribution distortion. This will help to further understand the laser modulation technology of relativistic electron beams in the terahertz band, thus promoting the development of terahertz photonic science.

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### **Footnotes**

### **I have read and accept the Privacy Policy Statement**

Yes

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