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Title:Terahertz radiation sources based on free electron lasers and their applications
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Abstract:The tunability, high power and flexible picoseconds-pulse time structure of terahertz (THz) radiation make the THz free-electron laser (FEL) a very attractive THz source of coherent radiation. This paper focuses on the development and perspectives of THz radiation sources based on the FEL. The principles of the low gain THz FEL oscillator, the SASE THz FEL amplifier and the supperradiant THz FEL are reviewed briefly, and the key technologies of THz FEL, such as injector, accelerator, undulator and optical cavity, are discussed, respectively. The current status of and future prospects for THz radiation sources based on the FEL are emphasized in this paper. Recent research and development have shown bright future in free-electron laser (FEL) THz radiation sources. The potential applications can be carried out in the field of imaging, material research, biology medicine, communication, diagnostics and many others.
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