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Superradiances from Ultra Short Electron Bunch Beam

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Message from the Guest Editors

Terahertz (THz) radiation, which lies in the frequency gap between infrared and microwaves, and typically refers to frequencies from 100 GHz to 10 THz, is finding use in an increasingly wide variety of applications: Information and communications technology; non-destructive evaluation; biology and medical sciences; and energy chemistry and material science. In the field of material science, THz radiation can be used for linear and nonlinear control of the physical properties, and measurement of the ultra-fast dynamic process of materials. There is great demand for THz sources that feature high power, ultra-short pulse, high-precision synchronization performance, and a broadly-tunable range of frequencies. An accelerator-based THz radiation source is one option to fulfil the feature listed above, especially in terms of high peak power, and easy and broad tunability. Particularly, free-electron laser and coherent synchrotron/transition radiations from ultra-short bunch electron beams are promising THz sources.