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Modern trends in compact terahertz systems and semiconductor chips

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A particular interest in development of modern terahertz (THz) technology [1] is dedicated to the development of compact, solid-state-based room-temperature, high-power, stable and portable terahertz emitters and sensitive detectors as well as user-friendly THz imaging and spectroscopy systems containing flat optics components with minimized optical alignment [2].

In this presentation, modern trends in evolution of compact THz imaging and spectroscopic systems will be reviewed. Special attention will be given to innovations in THz semiconductor chips development as well as their hybrid integration schemes. Optical engineering will be also considered underlying an employment of THz structured light in imaging and 6G wireless communications systems. An exceptional view will be directed to a compact silicon diffractive optics and nonparaxial case in THz optics design aiming to find rational approaches for integration of optical components directly on the chip [3].

Contemporary scientific and technological challenges as well as extrapolations of possible further evolution in the field will be discussed.

REFERENCES

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- [3] S. Orlov et al, Light Engineering and Silicon Diffractive Optics Assisted Nonparaxial Terahertz Imaging, *Laser & Photonics Reviews*, 2024, **18**, 2301197, 27 pages.