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Title:Continuous-wave terahertz in-line digital holography

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Abstract:A terahertz (THz) in-line digital holography project has been proposed based on a CO₂ pumped 2.52 THz continuous-wave laser and a pyroelectric-array camera used as the detector. The THz Gabor in-line digital holograms have been obtained and then the high resolution reconstruction of THz in-line digital holography was realized. The resolution of an in-line digital holography system has been tested by the use of a series of objects. High-quality and high-resolution reconstructed images have been obtained, and the real lateral resolution is higher than 0.2 mm. It can be inferred from the results that the THz Gabor in-line digital holography system has the abilities of real-time and high-resolution imaging.

Number of references:9

Inspec controlled terms:cameras - gas lasers - holography - image reconstruction - image resolution - pyroelectric detectors - terahertz wave imaging

Uncontrolled terms:continuous-wave terahertz in-line digital holography - continuous-wave laser - pyroelectric-array camera - detector - THz Gabor in-line digital holograms - high resolution reconstruction - reconstructed images - real lateral resolution - high-resolution imaging - frequency 2.52 THz - CO₂

Inspec classification codes:A4240 Holography - A4255D CO₂ lasers - A4230H Resolution of optical images - A4230V Image processing and restoration - A0762 Detection of radiation (bolometers, photoelectric cells, i.r. and submillimetre waves detection) - A0720 Thermal instruments and techniques - B4350 Holography - B4320C Gas lasers - B6135 Optical, image and video signal processing - B7230C Photodetectors - B2890 Other dielectric applications and devices - B7230G Image sensors

Numerical data indexing:frequency 2.52E+12 Hz

Chemical indexing:CO₂ O₂ C O

Treatment:Practical (PRA)

Discipline:Physics (A); Electrical/Electronic engineering (B)

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