

Terahertz Imaging

Reveal the invisible

Terahertz (THz) technology has many special features that make it attractive for imaging. In particular, its high penetration depth into many materials allows the detection of structures underneath the surface without destroying the sample. In contrast to X-Ray, which has similar properties, THz radiation is non-hazardous. Applications range from quality control to food monitoring to medical imaging. Its potential has been demonstrated repeatedly in laboratories. Meanwhile, the technology has advanced far enough that it is ready for industrial use. Nowadays, compact THz devices are available on the market.

The requirements for quality control and defect detection are getting more challenging, while the financial pressure for cost-effective solutions is increasing. Often quality assurance and control methods still involve manual, often just partial and most times destructive inspections, which are time- and resource-consuming.

In this context, THz imaging offers a valuable non-destructive and contactless alternative. Thanks to its ability to penetrate up to several centimeters into many materials (plastic, ceramic, wood, textile...), it can detect defects or inclusions of millimeter size

well below an object's surface. In addition, it can measure the thickness of layers a few tens of micrometers thick, as well as anisotropies in a material. Moreover, THz radiation is safe to use (non-ionizing) and can also provide spatially resolved spectroscopic information.

THz imaging has many applications including, but not limited to, quality control, security screening and biomedical imaging.

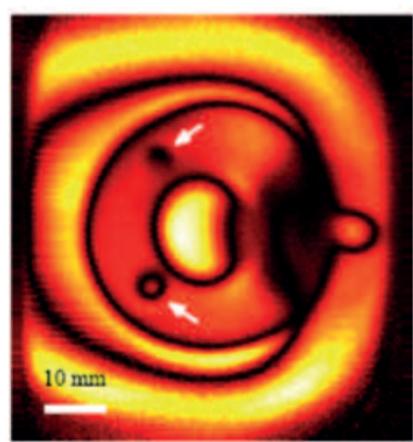
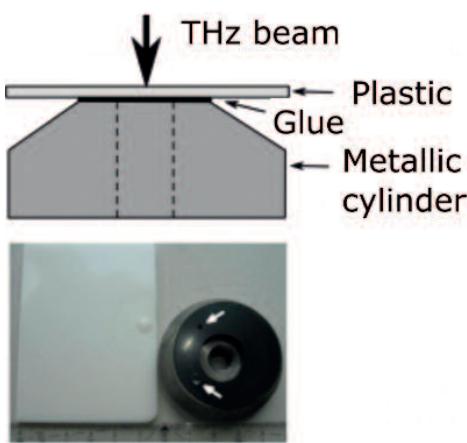


Figure 1: Detection of defects (holes) in a hidden glue layer.

Facts/Key-Values/ Features & Benefits

- Contactless, non-destructive and safe measurement method
- Can replace traditional (destructive) methods for imaging
- Penetration depth: up to several cm
- Axial resolution: several μm
- Lateral resolution: few mm
- Spectroscopy possible
- Detection of anisotropies possible

Potential Users Fields of Application

- Quality control
- Automotive industry
- Polymer welding
- Adhesive bonding
- Contamination detection
- Food and agriculture
- Safety & Security

Status – what do we offer?

- Transmission, reflection and polarization-sensitive measurements
- Test measurements in RECENDT labs
- Customer specific THz imaging solutions

Contact data

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