TERAHERTZ SPECTROSCOPY FOR NON-DESTRUCTIVE TESTING

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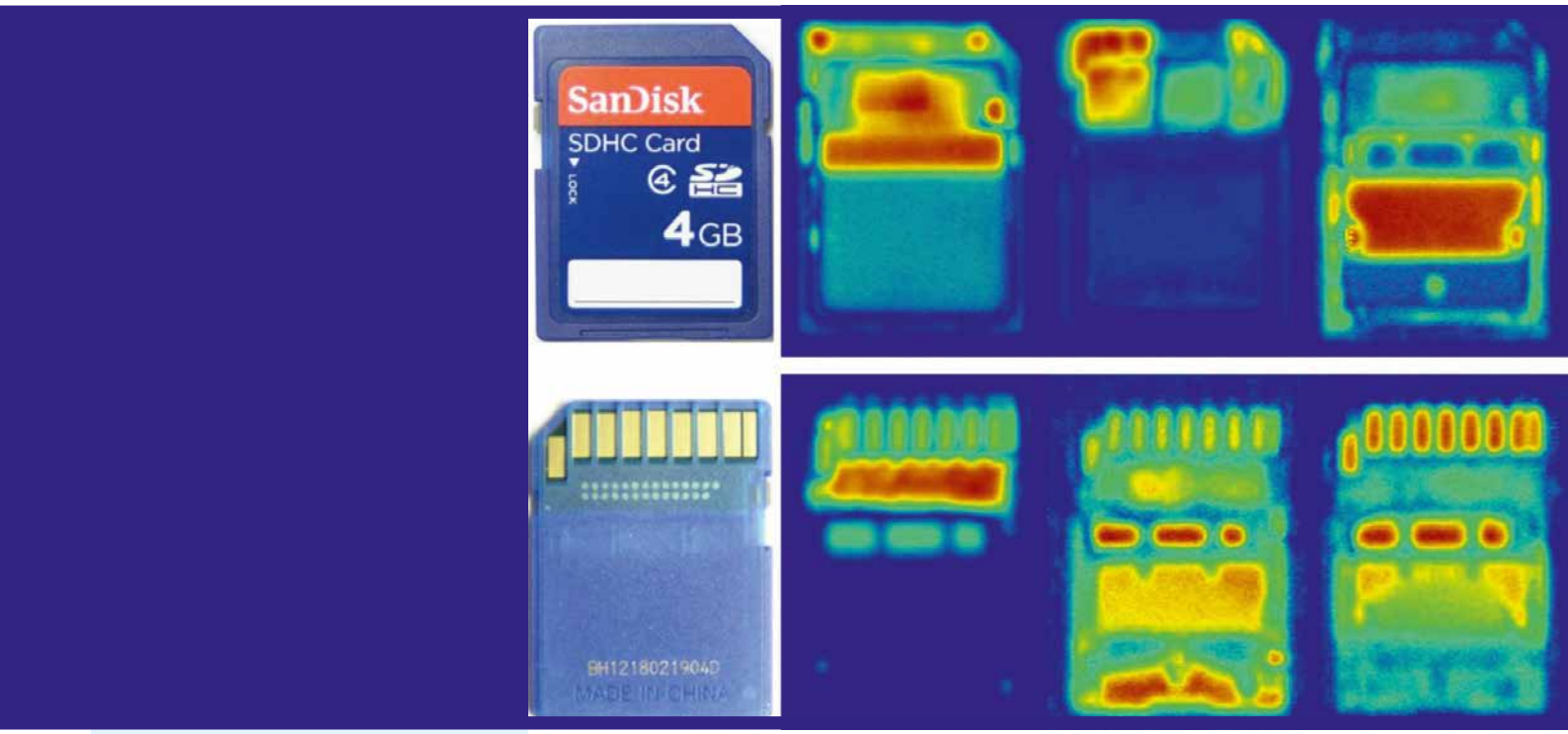

AT A GLANCE

Non-hazardous THz pulses are employed in contact free time of flight measurements for non-destructive testing of opaque materials.

Application example: THz image of an SD memory card. Cross-section images reveal the inner structure of the card layer-by-layer.

Features

- Contact-free
- Non-hazardous radiation, no additional safety measures required
- Temperature independent
- Fully fiber coupled
- Measurements in transmission or reflection geometry
- Up to 20 measurements per second

Applications

- Layer thickness determination
- In-line process monitoring
- Inspection of multi-layer samples
- Thickness determination
- THz imaging
- Defect identification and mapping

Technical background

Ceramics, polymers, paper, textiles, and industrial glues are transparent for THz radiation. Optically opaque materials can be penetrated and inspected with ultrashort, non-hazardous THz pulses in a time of flight measurement. The depth resolution is determined by the bandwidth of the THz-pulse and can be as low as a few 10 µm, depending on the specific material under test. The lateral resolution is approx. 0.3 mm. The fully fiber coupled THz system allows for flexible adjustments. The measurement is contact free and temperature independent.

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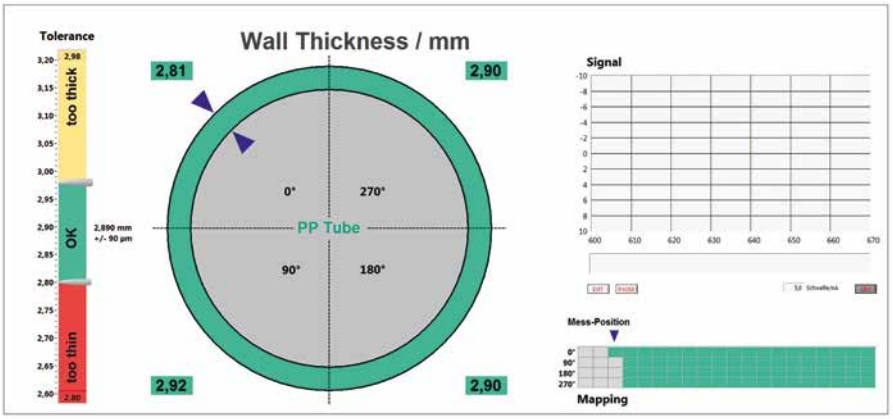

Specifications

- Frequency range 0.1 - 6.0 THz
- THz output power >50 µW
- Lateral resolution* 0.3 mm
- Max. depth resolution* 40 µm
- Accuracy* ± 2 µm

* Depending on sample characteristics and measurement geometry

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