



1 Terahertz waves can be used for earth observation, e.g. for the development of climate models.

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2 Detail of an integrated circuit with a transistor gate length of only 20 nm.

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## INTEGRATED CIRCUITS FOR TERAHERTZ FREQUENCIES

Terahertz waves penetrate smoke, dust, fog and clothing – even from a distance of several hundreds of meters. Therefore, this high frequency spectral range offers a wide variety of application potential. Fraunhofer IAF develops integrated electronic circuits based on III/V semiconductors for high frequencies. With a transistor cut-off frequency of over 1 THz the institute holds the European record.

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### Features

- Integrated circuits for frequencies up to 670 GHz
- Metamorphic high electron mobility transistors (mHEMTs)
- Material system (InAlAs/InGaAs) on 4" GaAs substrates
- Transistor gate length down to 20 nm

### Applications

- **Communication:** transmission of very high data rates
- **Security:** detection of concealed weapons
- **Air safety:** landing aid for helicopters
- **Astronautics:** climate and earth observation from space
- **Sensors:** high-precision distance measurements for quality assurance