

resolution²

THz generation with highest resolution and lowest phase noise

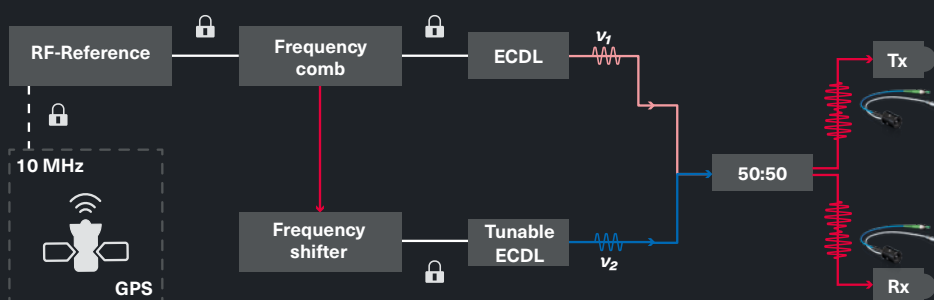
TeraScan ultra

Ultra-high-precision comb-locked
cw-terahertz platform

- Tunable yet precisely controlled THz source
- Spectral resolution as high as 1 Hz
- Enables photonic vector network analysis up to 5 THz



THz communication research, channel sounding, wafer probing



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Specifications	
Difference frequency tuning (laser)	0 – 10 THz
Difference frequency tuning (THz emission)	20 GHz – 5 THz
Tuning speed	Up to 0.1 THz/s
Frequency accuracy	Up to 1 Hz, depending on clock reference. Calibration-free!
Frequency resolution and step size	Up to 1 Hz
Terahertz power (typ.)	100 μ W @ 100 GHz / 10 μ W @ 500 GHz
Terahertz emitter	PCA-FD-1550-100-TX-1, InGaAs photodiode
Terahertz receiver	PCA-FD-1550-130-RX-3, Rh:InGaAs photomixer
Antenna type	Bow-tie
Terahertz polarization	Linear
Waveguide-coupled terahertz antennas	Upon request
Modes of operation	Fixed frequency Frequency scan, user-selected range and speed Triggered step scan
Frequency comb	MDFC Core 200+ CERO ("zero- f_{CEO} ") technology $f_{\text{CEO}} = 0$, by passive stabilization via difference frequency generation
Comb line spacing	200 MHz
Integrated phase noise f_{CEO}	< 40 mrad (100 Hz .. 2 MHz), < 65 mrad (70 mHz .. 20 MHz)
Optical bandwidth	80 .. 100 nm FWHM, with integrated extension module
Tunable laser	DLC CTL 1550 Tuning range 1510-1630 nm, mode-hop-free & computer-controlled
Fixed-frequency laser	DL pro or DLC CTL at 1550 nm

6.5 THz emission line of a pulsed emitter, pumped by the frequency comb of the TeraScan ultra, and analyzed by a cw-receiver driven by a 6.5 THz beat signal. The frequency resolution is 1 Hz and the FWHM linewidth of the signal is 2.3 Hz

Source: B. Krause, Technical Univ. Darmstadt

