



Product Line Card Terahertz Applications

2025 V1

For customized projects please Contact us:

info@simtrum.com

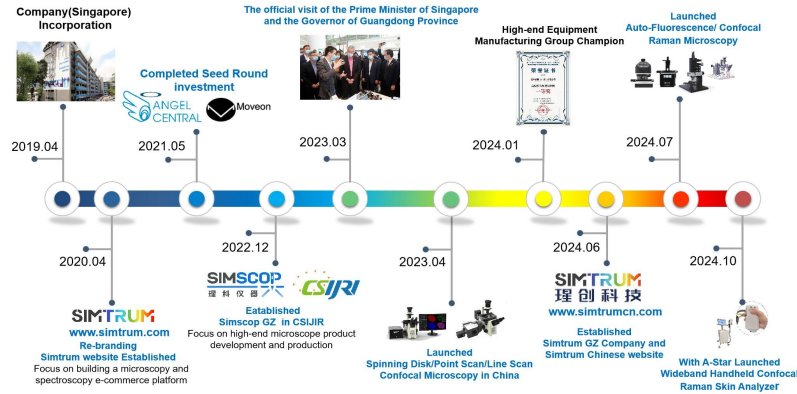
Company Profile

Established in Singapore in 2019, SIMTRUM Group specializes in innovation and applications within microscopy and spectroscopy. Its core team brings decades of optical technology expertise. In 2022, the company partnered with the CSIJRI in Guangzhou to establish a joint R&D laboratory for microscopy with independent research capabilities. The team now includes multiple Ph.D. graduates from the National University of Singapore (NUS), and has grown to dozens of members.

SIMTRUM has collaborated with leading institutions such as Nanyang Technological University (NTU), NUS, A-Star, and Xiamen University to develop high-end microscopy systems. In March 2023, the company's Guangzhou R&D center was visited by former Singapore Prime Minister Lee Hsien Loong and the Governor of Guangdong Province. Later that year, SIMTRUM won first prize in the startup category of the Guangzhou Technology Innovation and Entrepreneurship Competition and secured multiple technology patents.

Vision: To be a leading photonics technology company that truly understands and adds value to our customers.

Mission: Driven by innovation, we deliver exceptional services and precise products to global photonics users, empowering customer success and advancing industry transformation.

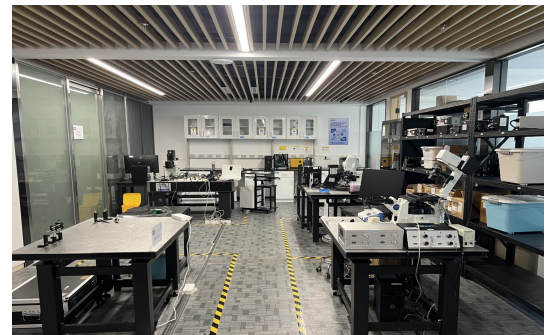
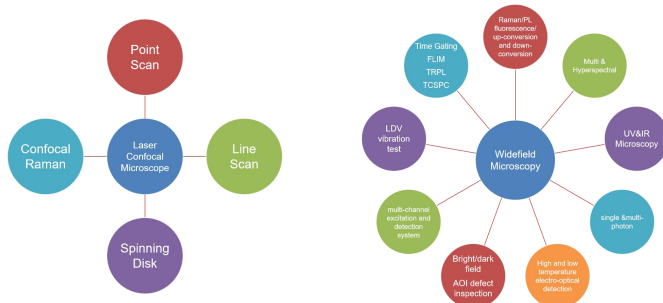


Company Milestones

Optical R&D Laboratory

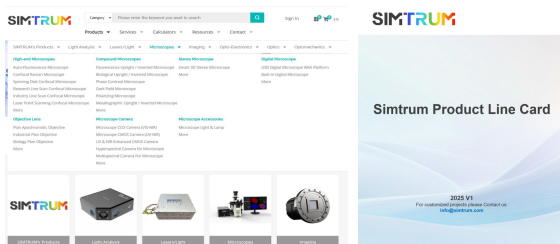
We have established a fully-owned optical laboratory in Guangzhou operating as a subsidiary of Simscope Instruments. This facility specializes in the R&D and manufacturing of high-end microscope systems and critical equipment components.

Our proprietary microscope systems include confocal laser microscopes and wide-field microscopes, along with core components such as detection modules, photomultiplier tubes (PMTs), silicon photomultipliers (SiPMs), multi-channel lasers, and motorized filter wheels. Additional products are currently under development.



Real scene of optical R&D laboratory

Focus on microscopy and spectroscopy e-commerce platform



Simtrum is a specialized e-commerce platform dedicated to microscopy and spectroscopy, serving scientific research, industrial, and healthcare fields with high-quality products and aiming to be a trusted partner in the sector.

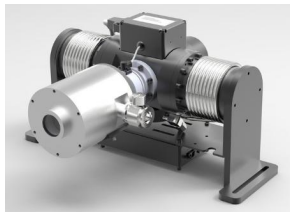
The platform features seven major product categories: Microscopes, Light Analysis, Lasers/Light sources, Imaging, Opto-Electronics, Optomechanics, and Optic, offering over 4,000 products in total. Each category is equipped with a product line card to facilitate efficient selection.

As a supply chain-integrated systems provider, Simtrum employs a rigorous testing system where every product undergoes professional inspection and performance verification before launch. This ensures reliability and delivers a ready-to-use, worry-free experience for customers.

E-commerce platform website: www.simtrum.com

With 10 years of expertise, we support 3,000+ customers with 30+ tailored solutions.
Trust Simtrum for your microscopy and spectroscopy needs.

Terahertz Source



THz Quantum Cascade Lasers

Frequency: 1.5-5THz
Average Power: 1-20mW
Laser Mode: Broadband Tunable,
Single/Multi-Mode

Terahertz Polarizers



THz Film Polarizers

Substrate: Polypropylene
Wavelength Range: 15-3000 μm
Effective Transmittance: > 80%
Extinction Coefficient: >47dB



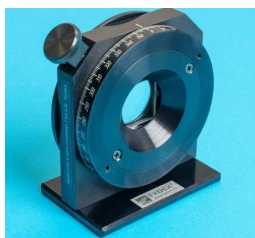
THz Wire Grid Polarizers

Effective Transmittance: > 92%
Extinction Coefficient: > 30dB
Distance Between Wires: 16-40 μm
Pulse Damage Threshold: > 20kW/cm²



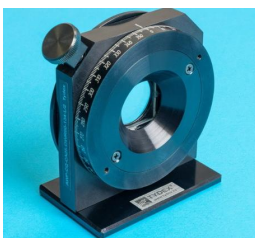
Tunable THz Polarization Converter

Half-wave monochromatic plate: 80-160 μm
Quarter-wave monochromatic plate:
150-300 μm
Birefringent filter: 120 μm



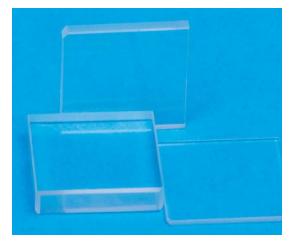
THz Achromatic Polarization Converter

Retardation: L/4
Wavelength Range: 60-300 μm
Clear Aperture: 25mm
Ellipticity Tolerance: $\pm 3\%$



THz Achromatic Wave Plate

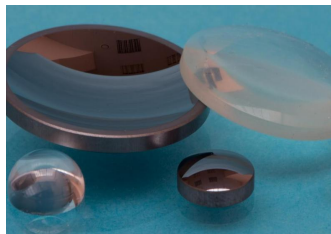
Effective Transmittance: > 92%
Extinction Coefficient: > 30dB
Distance Between Wires: 16-40 μm
Working Aperture: $\leq 136\text{mm}$



THz Waveplates

Retardation Type: $\frac{1}{2}$, $\frac{1}{4}$
Wavelength Range: 40-1000 μm
Material: THz Grade Crystalquartz
Orientation: X-cut

Terahertz Optics



THz Lenses

Material: HDPE, HRFZ-Si, TPX
Type: Plano/Bi-Convex, Meniscus, Conical
Diameter: 1, 1.5, 2 inches
Focal Length: 10-400mm



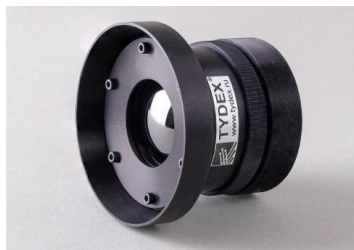
THz Fresnel Lenses

Material: COC (or HIPS, PLA)
Frequency Range: 0.1-1.5THz
Focal Length: 10-150mm
Thickness: 1-10mm



THz Aspherical F-theta Lenses

Material: COC TOPAS
Max. Scan Angle: $\pm 25^\circ$
Frequency Range: 0.1-1THz
Focal Length: 90mm



THz Objective Lenses

Focal Number: 0.7-0.95
Operating Range: 37GHz-6THz
Focal Distance: 13.2-44 mm



THz Beam Expanders

Expansion Ratios: $2\times$ - $10\times$
Operating Range: 6THz-37GHz
Material: HRFZ-Si



THz Reflective Beam Expanders

Expansion Ratios: $5\times$ - $8\times$
Coating: Aluminum, Silver, Gold



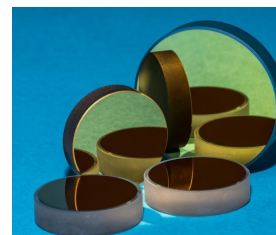
Off-Axis Parabolic Mirrors

With/Without Through Hole
Diameter: 1, 2 inches
Focal length: 10mm-400mm



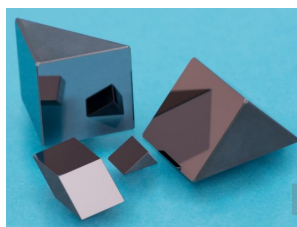
THz Hollow Retro Reflector

Clear Aperture: 0.5-2.5 inches
Coating: Gold, Silver, Aluminum
Material: Mounted Glass Glued/
Unmounted Aluminum One-piece



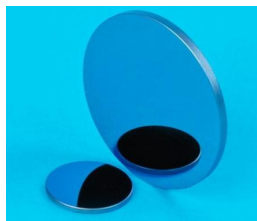
THz Mirrors

Coating: Protected Gold
Type: plano-plano



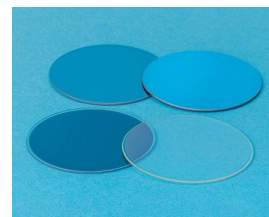
THz ATR & Right-Angle Prisms

Material: HRFZ-Si, ZEONEX
Sample Absorption Range: 10^2 - 10^4 cm^{-1}
Surface Accuracy: $\pm 0.01\text{mm}$



THz Beam Splitter

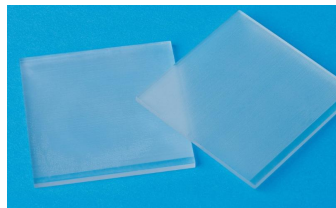
Material: HRFZ-Si
Type: Single-pass, Multi-pass
Diameter: $\leq 150\text{mm}$



THz Spectral Splitters

Type: NIR-THz & MIR-THz Spectral Splitter
Coating: High-reflection dielectric coating
($R > 90\%$) @ 730-860 nm & 9-11 μm

Terahertz Optics



THz Diffraction Gratings

Operating Range: 0.3-3 THz
Substrate: TPX, ZEONEX



THz Low/High Pass Filters

Cutting Wavelength: 13-1376 μ m
High transmittance in pass band
Stop Band Transmittance: <0.1%



THz Band Pass/Stop Filters

Operating Range: 0.1-15 THz
Pass Band Transmittance: 60-90%
Stop Band Transmittance: <4%

Terahertz Detection & Measurement Instruments



THz Impulse Radiation Electro-Optical Detector

Spectral Sensitivity: 0.1- 4THz
Min. THz Radiation Detection: 1nW
Signal Radiation Impulse
Duration:<120 fs



Golay Detectors

Window: HDPE, TPX, Diamond
Wavelength Range: 0.3-8000 μ m
Optimum Modulation Frequency: 15 ± 5 Hz



THz Camera

Detection Range: 0.1-40THz
Resolution: up to 1920×1080
Frame Rate: up to 60 fps
NEP: < 1.5pW/ \sqrt Hz



Golay Detector Calibration Set

Temperature Drift: $\leq \pm 0.1^\circ\text{C}$
Ambient Pressure Range: 760 - 10^{-3} mm Hg



THz Power Meter

Response Range: 0.1-35THz
NEP: < 0.55 nW/ \sqrt Hz
Pyroelectric Detector
Responsivity: 85kV/W



THz Beam Profiler

Frequency Range: 3-20 THz
Frame Rate: 12 fps@ 2048×2048
Dynamic Noise & Baseline
Correction Software

Terahertz Spectrometer



Integrated THz Time Domain Spectrometer

Spectrum Range: 0.1-5 THz
Spectrum Resolution: <5 GHz
Scanning Scope: ≥ 500 ps



Separate THz Time Domain Spectrometer

Spectrum Range: 0.1-5 THz
Spectrum Resolution: <5 GHz
Scanning Scope: ≥ 500 ps



Modular THz Time Domain Spectrometer

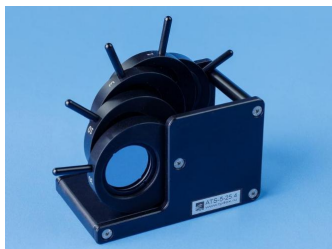
Spectrum Range: 0.1-5 THz
Easy Secondary Development
Modular Packaging&Visual Teaching Platform

Terahertz Detection Assemblies



THz Tunable Precision Attenuator

Operating Range: 15-600 μm
Attenuation: up to 40 dB
Material: Wire Grid/ Film Polarizer



THz Variable Attenuator

Operating Range: 40-1000 μm
Attenuation: up to 50 dB
Attenuator Set:
1%+3%+10%+30%+customized



THz Scanning Fabry-Perot Interferometer

Frequency Range: 0.02 - 15 THz
Mirror Positioning Accuracy: ± 1.25 μm
Clear Aperture: up to 52 mm

Terahertz Detection Systems



THz 3D Tomographic Detector

Imaging Range: 500mm*500mm
Axial Resolution: ± 30 μm
Surface Resolution: 1mm

Lock-in Amplifier



Lock-in Amplifier

Frequency Range: 0.01-250 kHz
Time Constant: 3ms-10s
Adjustable Sensitivity and Phase



Single-channel Lock-in Amplifier

Frequency range DC-60MHz
Input noise 3nV/sqrt(Hz)



Dual-channel Lock-in Amplifier

Frequency range DC-400MHz
Input noise 2.5nV/sqrt(Hz)

Optical Modulator & Accessories



Free Space Acousto-Optic Modulators

Operating Wavelength: 266-10640 nm
Operating Frequency: Up to 200 MHz



Pockels Cells

Operating Wavelength: 515-1064 nm
Operating Frequency: Up to 60 MHz



Optomechanical Chopper

Number of Sectors: 2,10
Modulation Frequency: 5-100Hz
Beam Aperture/ Sector: 50.5, 19.5mm



THz Cuvettes

Window Material: TPX
Sample Type: Particulate, Liquid,
Gaseous
Clear Aperture: 25 mm

Terahertz Generation Assemblies



Femtosecond Optical Parametric Amplifier

Tuning Range: 650nm-10μm
Pulse Width: 120~250fs



Dual Output Femtosecond Laser

Dual Output: 780nm & 1560nm
Average Power: >100mW
Pulse Width: < 100 fs



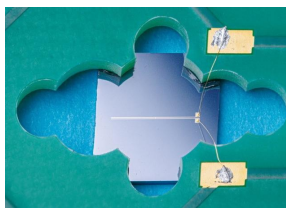
Broadband Femtosecond Laser

Wavelength Range: 950-1150nm
Peak Power: >75kW
Pulse Width: < 25 fs



High Power Femtosecond Laser

Wavelength Choice: 515nm, 780nm, 1030nm, 1560nm
Average Power: Up to 200mW
Pulse Width: <150 fs



THz Photoconductive Antennas

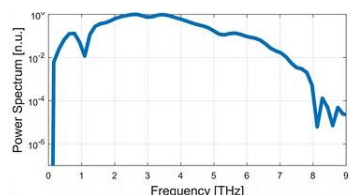
Photoconductive Material: LT-GaAs
Measuring Range: 0.1-2.2 THz
Pumping Laser: 780nm, <30 mW

Terahertz Crystals



ZnTe / GaSe THz Crystals

Thickness : 0.03-2mm
Dimension: φ7mm, 10×10mm



THz Organic Crystal

Material: BNA, DAST, OH1, DSTMS
THz Generator and Detector
High Damage Threshold



THz Window

Material: TPX, HDPE, HRFZ-Si, THz grade crystal quartz (z-cut), THz grade sapphire, ZEONEX
Thickness/Diameter: 1-10mm/1-5 inches



Non-linear Crystals

Material: LiNbO₃, BBO