Fast Receivers for THz and Middle IR ranges

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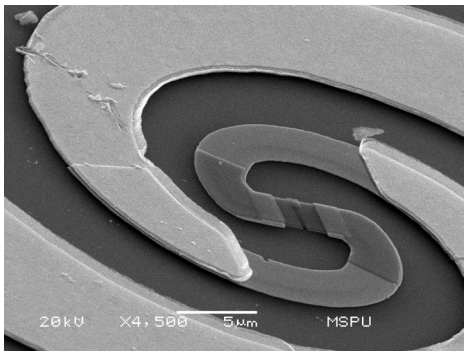
SCONTEL
SUPERCONDUCTING NANOTECHNOLOGY
Detect everything you want

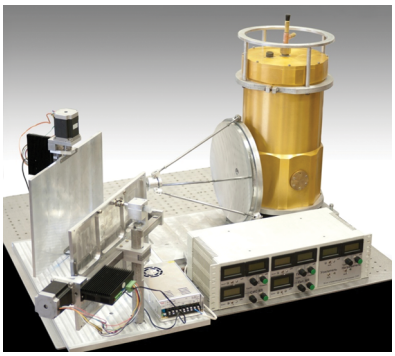
Scontel offers the fastest THz receivers available on the market today which are operated in a wide frequency range. We are pleased to present our high performance Receiver System based on the Superconducting Hot Electron Bolometer (SHEB) technology which is developed by our researchers.*

Possible applications:

- Radio astronomy observations (including space-based)
- Terahertz spectroscopy
- Near-field microscopy
- All-weather navigation systems
- Atmospheric Remote Sensing
- Fusion Diagnostics
- Electron cyclotron emission and interferometry
- Terahertz imaging for security
- Laser radiation detection
- Materials Characterization
- Network Analyses



Sensitive element of detector



THz imaging for security

All detectors come with one of fully packed cooling system:

1 - Receivers based on a Liquid Helium Cryostat

2 - Receivers based on a Closed Cycle Refrigerator

(Cryogenic Free)

* *Ivan Tretyakov, Sergey Ryabchun, Matvey Finkel et al., Applied Physics Letters, V. 98, pp. 033507, 2011.*

Ivan Tretyakov, Sergey Ryabchun, Matvey Finkel et al., IEEE Transactions on Applied Superconductivity, V. 21 (3), pp. 620 – 623, 2011.

Sergey Ryabchun et al., IEEE Transactions on Applied Superconductivity, V. 19 (3), pp. 293-296, 2009.

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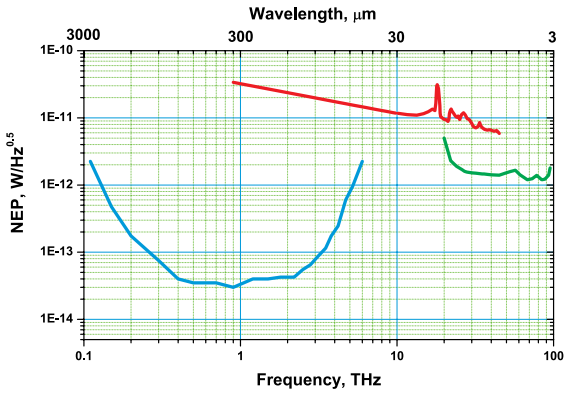
Advantages:

- ☑ OperResponse time down to 50 ps (world's fastest detectors of THz range)
- ☑ Ultra high sensitivity (noise equivalent power (NEP) down to **10^{-14} W·Hz$^{-1/2}$**)
- ☑ Operation frequency range from **0.1 THz** to **70 THz**
- ☑ Registration of short pulses (from nano- to picoseconds THz pulses)
- ☑ Different beam geometry (beam pattern **F/3** to **F/∞** (collimated beam))
- ☑ Local or remote control
- ☑ Full-support service (installation, operation training, technical support)
- ☑ Optimization of receiver system characteristics to the customer needs

System's operating characteristics are presented below:

Typical frequency dependence of the noise equivalent power (NEP) for the three types of receiver systems.

Blue line - type 1
Red line - type 2
Green line - type 3



Technical specifications of the THz receivers

Type	1	1a	2	2a	3	3a
Frequency range, THz	0.1-6		1-40		25-100	
Noise equivalent power (NEP), W×Hz$^{-1/2}$	5-7×10^{-14}	3-5×10^{-13}	1-2×10^{-11}	6-8×10^{-11}	1-2×10^{-12}	4-5×10^{-12}
Response time, ns	1	0.05	1	0.05	1	0.05
Dynamic range, μW	0.1		50		2	
Bandwidth of amplifier, MHz	0.01-200	1-3500	0.01-200	1-3500	0.01-200	1-3500

* All receivers can be based either on a closed cycle refrigerator or a liquid helium cryostat.

SCONTEL
5/22-1 Rossolimo Str.,
119021 Moscow, Russia
Phone: +7 (499) 246 1202
Fax: +7 (499) 246 6321
E-mail: scontel@scontel.ru