Superconducting Single Photon Detecting Systems

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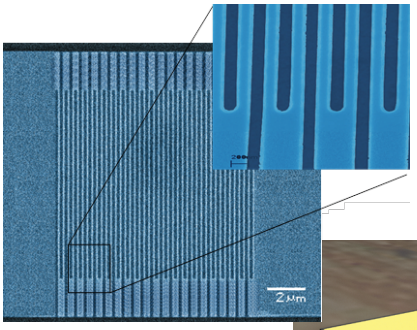
SUPERCONDUCTING NANOTECHNOLOGY
Detect everything you want

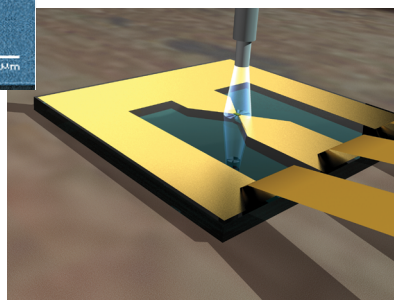
Scontel is pleased to present our single photon detecting system which has been developed by our researchers since 2001.*

Possible applications:

- Photonic quantum computing
- Photon correlation measurements
- Quantum cryptography
- Free space communication
- LIDAR
- Time-resolved fluorescence measurements
- Single quantum dot/molecule fluorescence spectroscopy
- Picosecond Integrated Circuits Analysis (PICA)
- Registration of extra low IR photon flux
- Optical tomography



Sensitive element of detector



Superconducting Single Photon Detector

Advantages:

- ☑ Operation in the visible and infrared ranges (**overlapping unavailable for APD range**);
- ☑ Operation in a continuous mode;
- ☑ No afterpulsing;
- ☑ Very low level of dark counts (below 0.01 cps)
- ☑ Picosecond time resolution;
- ☑ High quantum efficiency **(up to 90 %)**;
- ☑ One, two, or multi-channel systems
- ☑ Standard single-mode fiber input;
- ☑ Easy to integrate with LabView and other standard environment;
- ☑ Full-support service (installation, operation training, technical support);
- ☑ Optimization of receiver system characteristics to the customer needs.

All detectors come with one of fully packed cooling system:

1 - Single Photon Registration Systems based on a Cryogenic Insert for a standard liquid helium storage Dewar

2 - Single Photon Registration System based on a Closed Cycle Refrigerator **(Cryogenic Free)**

** G.Gol'tsman, O.Okunev, G.Chulkova et al., Picosecond supercovnducting single-photon optical detector // Applied Physics Letters. – 2001. - V. 79. N. 6. – P. 705-707.*

Superconducting Single Photon Detecting System

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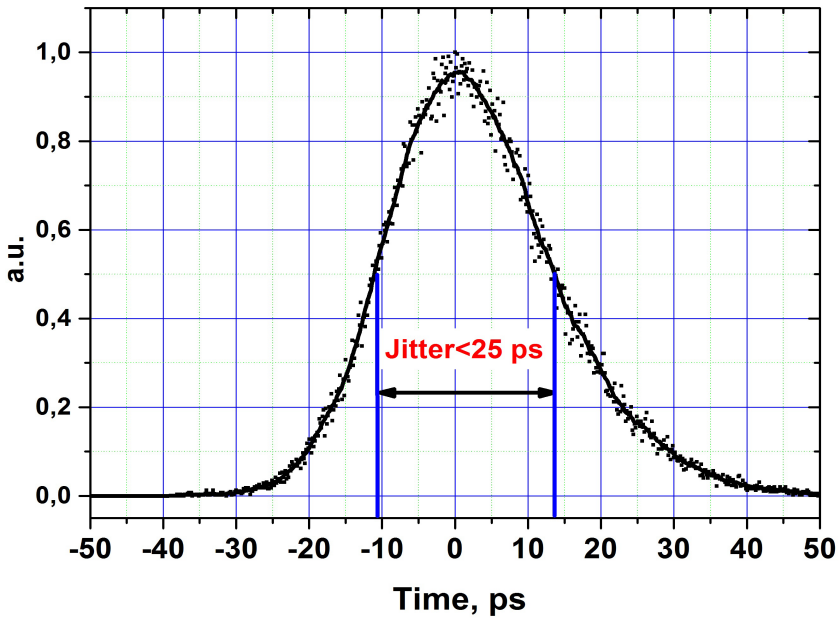
Standard system's characteristics:

Spectral range	Quantum efficiency referred to optical input	Dark counts rate	Output voltage signal	Counting rate (dead time)	Jitter
0.6÷2.3μm	≥ 90 %	≤10 cps	≥150 mV*	≥ 100MHz (≤10ns)	≤ 40ps

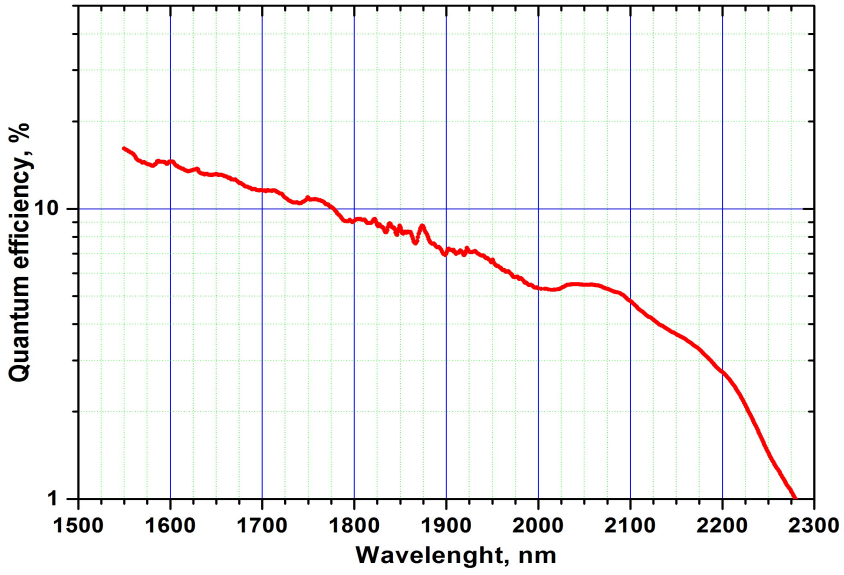
* Also we can provide other types of the output voltage pulses: TTL, ECL, LVDS.

SCONTEL has released the new line of products:

Ultra-fast single photon receiver



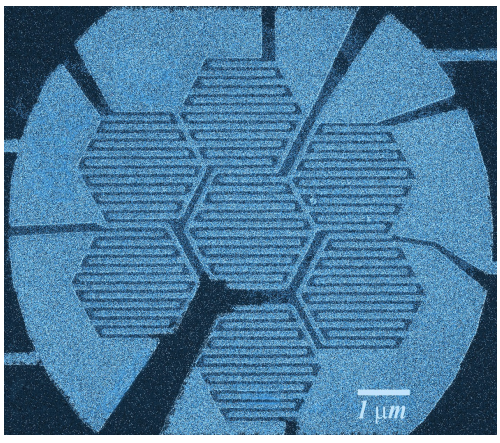
Long-wave single photon receiver



Ultra-Fast system:
timing jitter ≤ 20 ps
deadtime ≤2 ns
counting rate ≥500 MHz

Long-Wave system:
spectral range up to 2.5 μm

Extra-Low dark counting:
dark counts ≤0.01 cps



Matrix of the sensetive elements

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