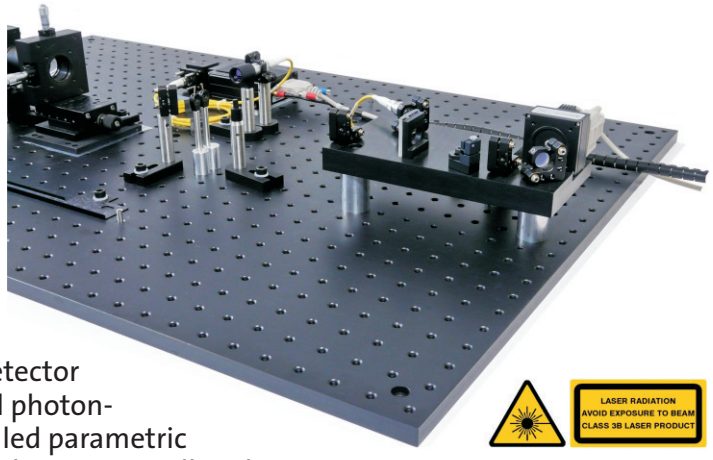
qutools

quEff

Absolute Efficiency Measurement System for Single Photon Counting Detectors

Key features

- Absolute detector efficiency measurements
- Unique correlated photon-pair system
- Widely selectable wavelength range
- Ready-to-use, no expertise needed
- Requires no external reference standards



The quEff is a complete system for efficiency calibration of photon counting detectors. The quEff operational principle applies a novel approach to detector efficiency measurements. It relies on the correlated photon-pair emission from the nonlinear optical process called parametric down-conversion and not on the comparison of results to externally calibrated detector standards like all the conventional methods. The detector calibration with quEff is direct, intrinsically self-referenced and absolute! The measurement procedure is simple and requires no special skills or previous training. The properties and performance of each quEff system (e.g. operating wavelength, maximum photon pair rate) are adjustable to meet the costumer specific needs and requirements.

Apparatus includes

- Down-conversion source of correlated photons
- Fiber-coupled single photon trigger detector
- Alignment utilities for quick detector positioning
- Three-channel counter with coincidence circuit
- Control and read-out unit

Optional accessories

- Counter with USB connection
- TTL/NIM converter module
- External trigger / Sync output
- Positioning stages for tested detector
- Time-resolved counting analyzer

quEff preliminary specifications	
Spectral Range	0.6 - 1.5 µm
Average Photon Repetition Rate	up to 5 MHz
Calibration Accuracy	typ. below 2 %
Coincidence Window Length	4 - 40 ns
Dimensions	Optical Unit: < 500 (l) x 500 (w) x 100 (h) mm Electronic Unit: 480 (l) x 300 (w) x 150 (h) mm
Counting Rate Interface	LED Display USB (optional, driver for Linux or Windows)

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