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Photon detection at subwavelength scales

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Stellingen

Behorend bij het proefschrift

Photon Detection at Subwavelength Scales

- I. The accuracy of quantum detector tomography does not always improve by measuring over a longer time interval.
This thesis, Chapter 2
- II. To fully understand the response of a meandering superconducting single-photon detector it is necessary to introduce the concept of a local detection efficiency.
This thesis, Chapter 4
- III. Compared to conventional scanning near-field optical probes, a nanoscale superconducting single-photon detector has a better signal collection efficiency. Moreover, it perturbs the field to be studied less.
This thesis, Chapter 5
- IV. A probe based on a superconducting single-photon detector can reach a spatial resolution smaller than the size of the probe apex.
This thesis, Chapter 7
- V. The approach taken by Heath et al. to improve the detection efficiency of a superconducting single-photon detector is incomplete insofar that it does not take into account the absorption distribution across the nanowire.
Nano Lett., **15**, 819(2015)
- VI. Although it is possible for the intensity of the optical near field of a sharp tip or optical antenna to be enhanced by a factor 1000, this does not apply to the absorption cross section of a finite-sized nanodetector close to such a sharp tip or optical antenna.
- VII. Surprisingly, the electromagnetic response of an antenna on a dielectric support, as simulated by F. Huth et al., can be well approximated by that of a bare optical antenna.
Nano Lett., **13**, 1065(2013)

VIII. The polarization dependence of the response of superconducting single-photon detectors, e.g. given by V. Anant et al. and Q. Guo et al., cannot be fully understood from only measuring the overall click probability of the detectors.

Opt.Express, **16**, 10750(2008) & *Sci.Rep.*, **5**, 9616(2015)

IX. Scientific communication should be an open platform for exchanging knowledge.

Qiang Wang,
Leiden, 27 oktober 2015