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(I) Quantum radiometry and metrology for single-photon detectors and emitters

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Single-photon detectors are being increasingly implemented in a variety of applications ranging from quantum information science to spectroscopy and remote sensing. These measurement techniques rely on the accurate detection of single photons at specific wavelengths. National metrology institutes worldwide, including the National Research Council Canada, have been developing characterization techniques and reference standards for such single-photon technologies. The implementation of quantum emitters as metrology single-photon source standards will enable the in-situ characterization of next-generation photonic technologies including quantum photonic integrated circuits, where single-photon sources, detectors, and other optical components for quantum communication and computation are fabricated on one on-chip platform. This presentation will discuss ongoing efforts in the development of characterization methodologies for single-photon technologies, including the need for consistency in the measurement of performance metrics for single-photon emitters.

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