IAF EARTH OBSERVATION SYMPOSIUM (B1)
Interactive Presentations - IAF EARTH OBSERVATION SYMPOSIUM (IP)

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PHOTONIC QUANTUM DETECTOR FOR EARTH OBSERVATION

Abstract

Integration of precise models of single-photon detectors Silicon Avalanche Photodiodes (Si-APDs) with single-photon detectors InGaAs APDs for the modes of a cavity which is shunted by induction by a square array of cylinders and for inter-qubit couplings induced by the cavity and crosstalk of the driveline in such a cavity, in order to reduce manufacturing costs while maintaining the same efficiency and reliability. The reduction of the coherent control error in an all-microwave two-qubit gate is described in detail using integrated detectors showing the Transition Edge Sensor on top of a waveguide and how the optical mode below is absorbed into the detector. This configuration helps reduce unwanted one- and two-qubit rotations that occur due to high crosstalk and transient behavior of control lines, which can for example be caused by line scatter or reflections from imperfect interfaces. , suitable in control wiring using Transition Edge Sensors well aligned to the center of the UV waveguide. The procedure for realizing two-qubit quantum logic in an easily scalable Transition Edge Sensor integrated circuit architecture with direct capacitive coupling between coaxial transmons with high-efficiency, on-chip detectors integrated with a mediating resonator for coupling between the qubits of which control line easily dominates the desired cross resonance interaction. The systematic approach to calibration presented here is likely to be widely applicable to two-qubit quantum control, regardless of the platform. Satellites acquire data for many tasks such as accurate and long-range weather forecasting, high-precision climate modeling, ecosystem monitoring, city planning, transportation, and disaster relief. Satellite data must reach users as quickly and reliably as possible to support emergency response teams and security services. If the amount of data is too large, the transmission should be continued on the next hover. Building a fast satellite data processing system has become a challenge in recent years. In conventional radio transmission, the satellite must be within range of an appropriate ground station; it may take up to eighty minutes to reach a transmit window. Observation of the difficulties inherent in alternative satellite data processing systems led the to consider a photonic quantum detector for Earth observation.