

Waveguide superconducting single-photon detectors for integrated quantum photonic circuits

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The monolithic integration of single-photon sources, passive optical circuits and single-photon detectors enables complex and scalable quantum photonic integrated circuits, for application in linear-optics quantum computing and quantum communications. Here we demonstrate a key component of such a circuit, a waveguide single-photon detector. Our detectors, based on superconducting nanowires on GaAs ridge waveguides, provide high efficiency (20%) at telecom wavelengths, high timing accuracy (60 ps), response time in the ns range, and are fully compatible with the integration of single-photon sources, passive networks and modulators.

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