

Recent progress in high-performance single photon detection at telecom wavelengths

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We generate single and entangled pairs of photons at telecom wavelengths using quantum dots and demonstrate quantum key exchange as well as entanglement and synchronization over a deployed optical fiber connecting our lab in downtown Stockholm to Ericsson research labs 17 km away.

A key element is the single photon detection for which we have developed high-performance superconducting nanowire single photon detectors. We will present results on detectors coupled to single mode optical fibers as well as free space multipixel detectors that enable spectroscopy by time-stamping every detection event to generate spectra as well as correlations, cross-correlations and lifetimes from one measurement with unprecedented detection efficiency, noise level and time resolution.