

## Performance of Superconducting Nanowire Single Photon Detectors at Visible and Infrared Wavebands

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This report will focus mainly on the recent progress in RISE on the research and development of superconductor single photon detectors (SSPD) with NbN superconducting nanowires. Ultra-thin NbN films were deposited on MgO substrates, and the SSPD devices with the NbN films were fabricated. We designed and packaged the devices based on single-mode fiber and SMA connector. Furthermore, a compact system, which is cost-effective, moveable, reliable and stable, was developed with six independent channels based on G-M cryo cooler and our detectors. For our detectors, the maximum system detector efficiencies of 0.32 for 404 nm photons, 0.21 for 660 nm photons and 0.10 for 1310 nm photons have been achieved at 3.4 K.<sup>1</sup> The timing jitter was concluded to be 55 picosecond through the jitter of pulse-pulse responses in our system.<sup>2</sup>

<sup>1</sup>L. Zhang, et al., Appl. Phys. B(2011) 102: 867-871.

<sup>2</sup>Q. Zhao, et al., Appl. Phys. B(2011) accepted.