

High efficiency InGaAs-based Single Photon Avalanche Diodes for quantum computing

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Near-infrared (NIR) single photon detectors (SPDs) have been used in several applications, such as optical time domain reflectometry (OTDR), light detection and ranging (LiDAR) and quantum key distribution (QKD). SPDs are demanded to exhibit high single photon efficiency (SPDE), low dark count rate (DCR), low jitter, and low afterpulsing probability. Among all of available SPDs, single photon avalanche diode (SPAD) receives much attention for a long while due to its advantages of solid-state material, compactness, ease-of use, and effective cost. In this talk, I will present our recent work on the fabrication and the characterization of single photon avalanche diodes (SPADs). A novel SPAD structure is proposed and its several figure of merits are acquired and discussed. Its application on quantum computing is highly envisioned.