3.5 The Application of Superconducting Nanowire Single-photon detector in Laser Ranging and Preliminary Measuring Results

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C-SPAD detector made by Czech Technical University in Prague with the characteristic of high precision, low jitter, time walk compensation, is being commonly used in the Chinese SLR network for nearly twenty years and the significant contributions have been made in the development of Chinese SLR techniques. As the development of SLR techniques in space debris observation and weak echo signal detection, the requirements of detectors with performances of lower dark current, higher quantum efficiency are put forward. The superconducting nanowire single-photon detector (SNSPD) has become one of most competitive detectors, because of its outstanding performances of wide spectral response range, high detection efficiency and low dark count rate, as well as small timing jitter. For validating the feasibility of SNSPD in laser ranging, the breadboard SNSPD have been made with the cooperation of the institute of Chinese Academy of Sciences and the trial-SLR measurements have been performed through Shanghai SLR system. This report introduces the principle and major performances of SNSPD and preliminary measuring results in SLR. It is expected that the SNSPD detector can held the position in SLR with the continual improvement of SNSPD techniques.