



## Improved Efficiency in Quantum Capacitance Detectors with Capacitively Coupled Absorbers

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Quantum Capacitance Detectors (QCDs) are terahertz detectors based on a Single Cooper-pair Box charge qubit. Radiation breaks Cooper pairs in a superconducting absorber, leading to quasiparticle tunneling to the qubit. This is then read out by a superconducting coplanar waveguide resonator. Here we present results on a type of QCD with capacitive coupling between the antenna and the absorber. We demonstrate photon shot noise limited performance for 1.5 THz radiation at loadings between 10-20 and 10-18 W with optical efficiency on the order of 30%. This detector's characteristics are appropriate to current scientific goals in far-infrared and submillimeter astronomy, such as observations of the epoch of reionization and of high-redshift galaxies.