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The Quantum Capacitor Detector – counting single photons in the far-infrared

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The Quantum Capacitance Detector (QCD) is a high-sensitivity direct detector under development for low background applications such as far-infrared spectroscopy from a cold space telescope. The QCD has demonstrated an optically-measured noise equivalent power of 2×10^{-20} W·Hz^{1/2} at 1.5 THz, making it among the most sensitive far-infrared (IR) detectors systems ever demonstrated. It has demonstrated the ability to count single far-infrared photons in single pixel and large array formats. As such, The QCD is an excellent candidate as the detector of choice for applications such as search for hidden sector dark matter and dark energy radiation. A brief overview of the operating principle and current status will be given.

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