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**Single photon detection with an actively quenched light emitting diode** DAVID STARLING, BLAKE BURGER, EDWARD MILLER, JOSEPH ZOLNOWSKI, JOSEPH RANALLI, Penn State University — Light emitting diodes (LEDs) have applications in many industries for illumination. However, the LED is not limited only to the generation of light. In this presentation, we demonstrate and analyze the LED for use as a single photon detector and make comparisons to its more costly relative, the avalanche photodiode. We show that LEDs can operate in reverse bias for single photon detection and can even be actively quenched to improve maximum count rates. However, typical LEDs suffer from a few notable drawbacks including long reset times and poor efficiency. Despite these drawbacks, the LED provides a low cost alternative to the avalanche photodiode for use in an advanced lab setting or for photon counting experiments.

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