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M3Or2C-01 [Invited]: Detecting Single Photons with a Graphene-Based Josephson Junction

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With its unique band structure endowing it with wideband absorption and exceptionally low heat capacity, graphene is an ideal candidate for the study of single photon detection from the near-infrared regime all the way to the microwave regime. Here we present 1) modeled results demonstrating the promise of the graphene-based Josephson junction (GJJ) as a wideband single photon detector, 2) experimental results demonstrating a GJJ bolometer detecting microwave radiation with few-photon sensitivity, and 3) experimental results demonstrating the ability to switch a GJJ from superconducting to resistive with single near-infrared photons.

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