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Tunable emission from InAs quantum dots gated with graphene<sup>1</sup> LAURA KINNISCHTZKE, University of Rochester, Department of Physics Astronomy, KENNETH GOODFELLOW, University of Rochester, Institute of Optics, CHITRALEEMA CHAKRABORTY, University of Rochester, Materials Science, YIMING LAI, ANTONIO BADOLATO, University of Rochester, Department of Physics Astronomy, NICK VAMIVAKAS, University of Rochester, Institute of Optics — We demonstrate Stark shifted photo-luminescence from InAs quantum dots (QD) using an n-i-Schottky diode where graphene has been used as the Schottky barrier material. This hybrid photonic device is motivated by the need for tunable single photon sources with high flux and storage capabilities. Photonic crystal nanocavities decorated with a single QD provide a rich environment for coupling spins and photons, in addition to accessing cavity quantum electrodynamic physics. Methods currently used for electrically tuning the QD inside the cavity suffer from a loss of the cavity quality factor, or high leakage currents in the diode which impacts the spin-photon coupling of the device. Our measurements are a first step towards using a graphene flake to electrically tune the emission of a strongly coupled QDcavity system.

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