Abstract Submitted
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Photon Statistics of Quantum Dot Resonance Fluorescence under the Influence of an Above Band-Gap Laser DISHENG CHEN, GARY LANDER, KYLE KROWPMAN, West Virginia University, GLENN SOLOMON, Joint Quantum Institute, NIST University of Maryland, Gaithersburg, MD, EDWARD FLAGG, West Virginia University — We study the statistical behavior of resonance fluorescence from self-assembled InAs quantum dots (QDs) as a function of the density of free charge carriers introduced by an above band-gap laser. Second-order correlation measurements show bunching behavior that changes with above-band laser power and is absent in purely above-band excited emission. Resonant photoluminescence excitation spectra indicate that the QD experiences discrete spectral shifts and continuous drift due to changes in the local charge environment. These spectral changes, combined with tunneling of charges from the environment to the QD, provide an explanation of the bunching observed in the correlations.

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