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Photon Statistics of Quantum Dot Resonance Fluorescence under the Influence of a Non-Resonant Laser DISHENG CHEN, GARY LANDER, CABOT ZABRISKIE, 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 a HeNe laser. Second-order correlation measurements show bunching behavior that changes with HeNe laser power. Resonant photoluminescence excitation spectra indicate that the QD experiences discrete spectral shifts due to changes in the local charge environment. These spectral shifts, combined with tunneling of charges from the QD to nearby defects, provide an explanation of the bunching observed in the correlations.

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