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Pump Wavelength Dependent Time Correlated Photoluminescence Spectroscopy of Giant Quantum Dots AALAP VERMA, SIDDHARTH SAMPAT, ANTON MALKO, University of Texas at Dallas, JENNIFER HOLLINGSWORTH, YAGNASENI GHOSH, HAN HTOON, Los Alamos National Laboratory — Quantum dots have gained significance as high quantum yield photon sources in many applications. A new breed of "giant" quantum dots (gQDs) developed at Los Alamos National Labs consisting of a CdSe core coated with several mono-layers of CdS have shown suppressed blinking [1]. gQDs have been shown to exhibit two types of blinking – Type A, associated with short off-state lifetime and Type B, characterized by long off-state lifetime [2]. However, the appearance of A or B type blinking is unpredictable and intermittent. We conduct pump wavelength dependent time correlated PL spectroscopy on gQDs to narrow down the causes of appearance of these blinking types. Our results suggest that there is a faster PL decay when excitons are pumped in the shell as compared to when only the core is pumped. This suggests that pumping the core opens up various non radiative decay channels, some of which may lead to type B blinking. Studies on dependence of blinking rates on pump wavelength are currently undergoing.

[1] Malko et al; Pump Intensity and Shell Thickness Dependent Evolution of Photoluminescence Blinking in Individual Core/Shell CdSe/CdS Nanocrystals; nl2025272
[2] Galland *et al*; Two types of luminescence blinking revealed by spectroelectrochemistry of single quantum dots; nature10569

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