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Photoluminescence blinking and carrier dynamics in giant nanocrystals with different electron confinement SID SAMPAT, University of Texas at Dallas, YIJUN GUO, JAVIER VELA, Iowa State University, ANTON MALKO, University of Texas at Dallas — Quantum dots have shown great promise as high quantum yield photon sources for applications in bioimaging, LEDs, lasers, etc. However, their photoluminescence (PL) intermittency (blinking) often complicates practical implementations. Recently, a new breed of giant nanocrystal quantum dots (gNQDs) with a large number of shell monolayers (ML) has been developed that show strongly suppressed blinking[1] and existence of multiexcitons.[2,3] So far, their PL emission has been limited to around 630nm. In this work, we broadened this approach and extended gNQD emission to shorter wavelength in the visible spectrum. We investigated photostable CdSe/CdS gNQDs with small (480nm emission) core and compared them to large (625nm emission) core non-blinking gNQDs with similar shell thickness (14-17 ML). The small core dots show increased blinking behavior and shorter PL decay times in comparison to large core dots. The observed difference in blinking behavior is suggestive of different carrier confinement regimes leading to enhanced electron trapping at the dot's surface as well as modifications to non-radiative Auger recombination rates.

[1]Y. Chen *et al.*, *JACS* **130**, 5026 (2008)
[2]Y.S. Park *et al., Phys. Rev. Lett.* **106**, 187401 (2011)
[3]A. V. Malko *et al.*, *Nano Lett.*, accepted (2011)

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