

Supplementary Information

Coherent modulation of two-photon up-conversion from colloidal quantum dots by femtosecond laser

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1. Sample preparation

CdSe core QDs were synthesized according to the method introduced in ref. 1 and ref. 2. CdSe/ZnS core/shell QDs were purchased from Najing Technology Corporation Limited. CdS QDs doped glass was synthesized by a modified melt-quenching method³. A potassium borosilicate glass with the composition of SiO₂ (72%), B₂O₃ (9%), and K₂O (19%) (in mol% of each oxide) was chosen as the matrix and CdS (1 wt%) was added to raw material mixture. The glass sample was melted in alumina crucible at 1400 °C for 1 h and then cast into a brass mold followed by annealing at 650 °C for 8 h.

2. Experimental results

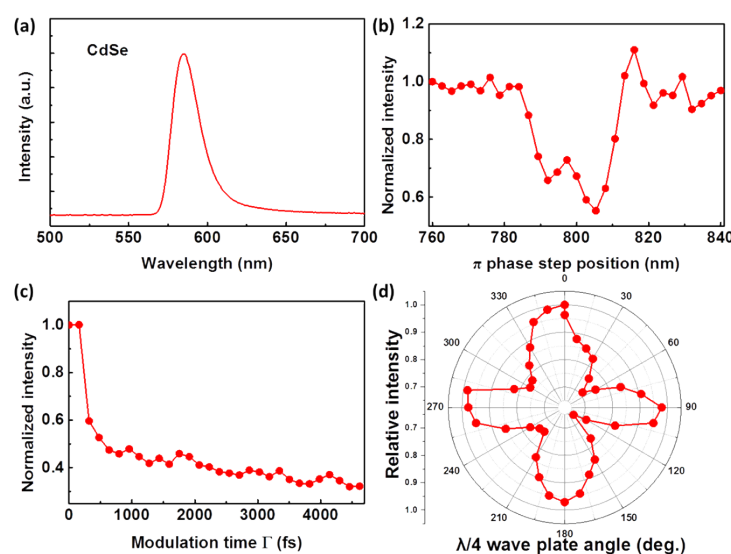


Fig. S1 (a) The two-photon fluorescence spectrum of CdSe core QDs, and two-photon fluorescence intensity as a function of (b) the π phase step position, (c) the modulation time Γ and (d) the $\lambda/4$ wave plate angle excited by 800nm femtosecond laser with the repetition rate of 1 kHz.

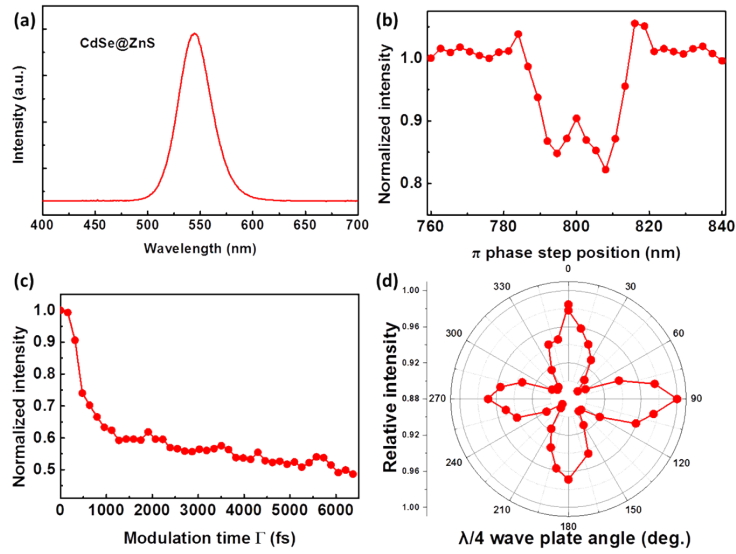


Fig. S2 (a) The two-photon fluorescence spectrum of CdSe/ZnS core/shell QDs, and two-photon fluorescence intensity as a function of (b) the π phase step position, (c) the modulation time Γ and (d) the $\lambda/4$ wave plate angle excited by 800nm femtosecond laser with the repetition rate of 1 kHz.

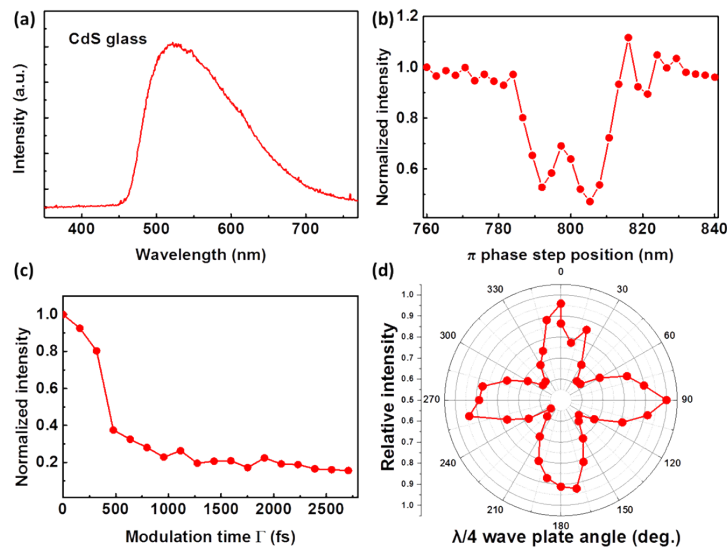


Fig. S3 (a) The two-photon fluorescence spectrum of CdS glass, and two-photon fluorescence intensity as a function of (b) the π phase step position, (c) the modulation time Γ and (d) the $\lambda/4$ wave plate angle excited by 800nm femtosecond laser with the repetition rate of 1 kHz.

Reference

- 1 W. Nan, Y. Niu, H. Qin, F. Cui, Y. Yang, R. Lai, W. Lin and X. Peng, *J. Am. Chem. Soc.*, 2012, **134**, 19685.
- 2 H. Qin, Y. Niu, R. Meng, X. Lin, R. Lai, W. Fang and X. Peng, *J. Am. Chem. Soc.*, 2014, **136**, 179.
- 3 V. Sukumar and R. H. Doremus, *Phys. Status. Solidi. B*, 1993, **179**, 307.