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Anti-bunching Behavior of the Red-Emission from Single Quantum Dots YI-CHENG CHEN, JUI-HUNG HSU, National Sun Yat-sen University — Ultra-small quantum dots exhibit band-to-band transition emission, as well as strong broadband red-emission. It is believed that the red-emission originates from the surface mid-gap state transitions. We study the correlation of the red-emission properties of CdSe/ZnS quantum dots by single object fluorescence. It is found that the red-emission portion is very different from one QD to another QD. The collected fluorescence was dichroic split, and sent into two photon counting detectors for monitoring band-to-band transition, and red-emission, respectively. The red-emission species exhibits different decay dynamics from the band emission. However, anti-bunching correlation indicates that quantum emitter behavior of single quantum dot, and the red-emission is not directly photo-excited by the excitation laser, but energy transferred from the exciton in the quantum dot.

Jui-Hung Hsu
National Sun Yat-sen University

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