

18

Models of semiconductor quantum dots blinking based on spectral diffusion *

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Three models of single colloidal quantum dot emission fluctuations (blinking) based on spectral diffusion were considered analytically and numerically. It was shown that the only one of them, namely the Frantsuzov and Marcus model reproduces the key properties of the phenomenon. The other two models, the Diffusion-Controlled Electron Transfer (DCET) model and the Extended DCET model predict that after an initial blinking period, most of the QDs should become permanently bright or permanently dark which is significantly different from the experimentally observed behavior.

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