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Theoretical explanation of correlations between on- and off-events in quantum dot fluorescence intermittency[1] SANDOR VOLKAN-KACSO, PAVEL FRANTSUZOV, University of Notre Dame, BOLDIZSAR JANKO, University of Notre Dame and Institute for Theoretical Sciences — Clear correlations have been found recently between the on- and off-events in the intensity trajectories of single colloidal quantum dots. These so-called memory effects have been found by the application of the commonly used threshold analysis. We propose, for the first time, a theoretical explanation for these correlations by using the theoretical framework of multiple recombination centers for fluorescence intermittency (blinking). The correlations are found to be threshold dependent and the Pearson correlation coefficient is shown to be both positive (on-on and off-off) or negative (on-off). We demonstrate that the model of multiple recombination centers can easily reproduce both the correct trends and signs of the correlations. The long correlations, as opposed to other models of blinking, are intrinsic to our model.

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