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Blinking in nanoscale systems: a universal theoretical framework SANDOR VOLKAN-KACSO, California Institute of Technology, PAVEL FRANTSUZOV, BOLDIZSAR JANKO, University of Notre Dame — Fluctuations of fluorescence intensity (blinking) is observed in many different kinds of optically active nanoscale objects. These fluctuations with extremely long-term correlations manifest on timescales longer than seconds and were observed in the emission of colloidal and self-assembled quantum dots, nanorods, nanowires, and some organic dyes. We suggest the idea of a universal physical mechanism underlying the blinking phenomenon. Here we show that the features of this universal mechanism can be captured phenomenologically by the multiple recombination center model (MRC) we proposed in a recent work to explaining single colloidal QD intermittency. Within the framework of the MRC model we qualitatively explain all the important features of fluorescence intensity fluctuations for a broad spectrum of nanoscale emitters.

Sandor Volkan-Kacso
California Institute of Technology

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