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Exciton migration and fluorescence quenching in photosystem II

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When exposed to excess light illumination photosynthetic organisms switch into a photoprotective quenched state where the excess energy is safely dissipated as heat. It was recently discovered that the main light-harvesting complex of plants, LHCII, plays a key role in the dissipation of excess energy. Here we demonstrate that the excitation kinetics in the quenched state can be described by a simple model, which assumes specific trapping centers to be present in the system [1]. In order to explain the experimental results exciton-exciton annihilation is taken into account. To verify the effectiveness of the non-photochemical quenching center, possessing a short lifetime, in preventing the excess excitations from reaching the reaction center, the studies of the excitation quenching depending on positioning and origin of the quencher in the antenna complexes are also considered.

[1] N. E. Holt, D. Zigmantas, L. Valkunas, X.-P. Li, K. K. Niyogi, G. R. Fleming, *Science* 307, 433 (2005).