

Abstract Submitted
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Emission line shape of B850 band of light-harvesting complex II¹

PRAVEEN KUMAR, SEOGJOO JANG, Department of Chemistry & Biochemistry, Queens College of the City University of New York, 65-30 Kissena Boulevard, Flushing, New York 11367 — A theoretical framework is developed for the emission line shape of the single complex spectroscopy (SCS). The quantum mechanical characteristics of the single complex emission line shapes for the model B850 band of the light harvesting complex 2 of purple bacteria are studied including both static and quasi-static disorders within the exciton Hamiltonian. The bath is modeled as an infinite sum of harmonic oscillators. For the Gaussian type of disorder, we examined the dependencies of the spectral line shapes on the temperature, polarization of the radiation, and on the type of exciton-bath coupling. Theoretically obtained emission profile is also compared with the absorption profile in the frequency domain. It is observed that emission profile contains an extra inhomogeneous term coming from the entanglement of the system and bath degrees of freedom in the initial equilibrium density operator. Contribution of this term to the overall emission line shape is studied in detail.

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