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Study of excitonic energy transport in thin-film J-aggregates STEPHANIE VALLEAU, SEMION SAIKIN, MAN-HONG YUNG, ALAN ASPURU-GUZIK, Department of Chemistry and Chemical Biology, Harvard University — The concentration and transfer of light through materials is one of the main current scientific goals in the ongoing quest for a new clean energy source. Molecular structures with optimal exciton transfer properties find widespread applications, ranging from solar cells and photonic devices to photographic and lithographic systems. J-aggregates of organic dye molecules are a good example of such structures where a strong interaction between molecular electronic transitions results in a partial exciton delocalization and a large exciton diffusion length. In this presentation I will discuss theoretical aspects of exciton dynamics in two dimensional films of J-aggregates with an emphasis on macroscopic transport properties that could be used for device modeling. As specific illustrations I will use results of our recent studies of exciton dynamics in aggregates of cyanine dyes.

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