

Tuning Excited States in Conjugated Polymers for Electronic Devices

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Abstract

The device performance of organic electronic devices such as Organic Light Emitting Diodes (OLEDs) and Organic Photo Voltaic Celle (OPVs) depend upon the relative energies of the excited singlet state and the triplet state. If the triplet state is located closer in energy to the excited singlet state then it is possible to improve the OLED efficiency via reverse intersystem crossing. On the other hand, if the triplet state is at or below half the excitation energy of the singlet state, it could promote singlet fission leading to higher OPV efficiency. In this talk I will discuss the nature of these excited states and how the relative energies of these excitations can be tuned by parameters such as dimerization and donor-acceptor substitutions by studying model exact many-body states of long-range interacting models.