Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Transient magneto-photoinduced absorption study of singlet fission in low band gap copolymers UYEN HUYNH, Z. VALY VARDENY, Univ of Utah — We have observed the existence of singlet fission in thin films of low band gap (LBG) copolymers, PDTP-DFBT and PTB7, using the ultrafast optical pump/probe spectroscopy, probed at the energy range from IR to MIR. The singlet fission is the dissociation of a singlet exciton into two triplets through an intermediate triplet pair state (TT pair) in an overall singlet configuration; in the studied copolymers, it was observed to be very fast, in femtosecond time domain. The intermediate TT state, which dissociates into two separated triplets at later time, or recombines to the ground state appears instantaneously with the singlet exciton formation using our laser system that has $\sim$ 150 fs time resolution. The interplay between the rate of singlet fission into sTT pairs, triplet fusion back to singlet excitons and relaxation between the TT spin sublevels explains the obtained opposite pattern of the transient magnetic field response on the dynamics of singlet excitons and TT pairs.

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Date submitted: 10 Nov 2014 Electronic form version 1.4