

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Spin dynamics of photoexcited polarons in MEH-PPV: optically detected magnetic resonance studies CUNGENG YANG, ZEEV VARDENY, University of Utah, EITAN EHRENFREUND, Technion University — We studied the *full dynamics* of the photoluminescence detected magnetic resonance (PLDMR), photoinduced absorption (PA), and PA detected magnetic resonance (PADMR) in MEH-PPV films, as a function of microwave power, P , and modulation frequency, f_M . We found it critically important to measure both in-phase and quadrature components; otherwise key characteristics of the dynamics are not unraveled. For example, the PLDMR in-phase component *changes sign* at $f_M = f_0$ of about 30 kHz before decaying at higher frequencies. In contrast the quadrature PLDMR component retains its sign within the same experimental frequency range. We account for these peculiar dynamics by a model in which the polaron recombination is spin dependent (SDR). Specifically by solving the SDR rate equations we found that it correctly explains the PLDMR frequency dependent phase, and reproduce the obtained increase of f_0 with P . Also the SDR model explains equally well the PADMR and PLDMR time resolved measurements.

Cungeng Yang
University of Utah

Date submitted: 19 Nov 2006

Electronic form version 1.4