

Abstract Submitted
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Magneto-Photoinduced Absorption in Organic Polymer Films BHOJ GAUTAM, THO NGUYEN, Department of Physics and Astronomy, University of Utah, Salt Lake City, UT 84112, EITAN EHRENFREUND, Physics Department, Technion-Israel Institute of Technology, Haifa, Israel, Z.VALY VARDENY, Department of Physics and Astronomy, University of Utah, Salt Lake City, UT 84112 — In order to elucidate the underlying mechanism of magneto-conductivity (MC) in OLEDs we studied magneto-photoinduced absorption (MPA) response in polymer films. The films were based on the MEH-PPV polymer in three different forms, namely: pristine film; film exposed to prolonged UV illumination; and MEH-PPV/PCBM blend having weight ratio 1:1. In pristine film we show that the MPA at low excitation intensity is due to sublevel spin mixing of triplet excitons; whereas at high excitation intensity the MPA is dominated by the triplet-triplet annihilation process. In UV illuminated MEH-PPV films that support photogenerated polarons we show that the MPA is due to sublevel spin-mixing of polaron-pairs via the hyperfine interaction with the closest hydrogen atoms to the chain. This mechanism also explains the MC response of OLED based on MEH-PPV, since its response is similar to that of MPA. Finally we found that the MPA in MEH-PPV/PCBM blend films is dominated by spin mixing of polaron-pair on the polymer and fullerene molecules, via the Δg mechanism. Supported by the NSF DMR-1104495, the NSF MRSEC at the UoU, and the BSF program.

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