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Correlation between magneto-photocurrent and power conversion efficiency in organic solar cells BHOJ GAUTAM, TEK BASEL, DALI SUN, Department of Physics and Astronomy, University of Utah, Salt Lake City, UT 84112, USA, 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, USA — In order to investigate the effect of spin 1/2 radical on the photocurrent in organic solar cells, we studied magneto-photocurrent (MPC) and power conversion efficiency (PCE) of "standard" P3HT:PCBM (1.2:1) device at various Galvinoxyl radical wt%. The MPC measurements were performed to understand the increase in Jsc and hence PCE of the OPV device with Galvinoxyl wt%. We found that the MPC reduction with Galvinoxyl wt% follows the same trend as that of the PCE enhancement. We propose that MPC in OPV blends is due to spin-mixing mechanism related with the manifold of the charge transfer (CT) state at the donor-acceptor interfaces. Our results thus demonstrate that the Galvinoxyl spin 1/2 radical additives act as spin flip initiator within this exciton manifold. This process is unraveled via MPC of the doped devices. Supported by the NSF-MRSEC program at the UoU.

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