

Abstract Submitted  
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**Comparison of spin and charge transport in organic semiconductor P3HT**<sup>1</sup> MATTHEW GROESBECK, HAOLIANG LIU, EVAN LAFALCE, DALI SUN, HANS MALISSA, MARZIEH KAVAND, CHRISTOPH BOEHME, ZEEV VALY VARDENY, Department of Physics Astronomy, University of Utah — We have investigated spin and charge transport processes in regio-regular poly(3-hexylthiophene) (P3HT) in order to compare spin-transport and charge-transport in organic semiconductors. For the spin transport we measured the spin diffusion length,  $\lambda_s$  via the inverse spin Hall effect (ISHE) in NiFe/P3HT/Pt trilayer devices, whereby a pure spin-current is generated in the polymer by spin-pumping from the ferromagnetic layer (NiFe), then diffuses to the Pt layer where it is converted into an electrical signal due to the strong spin-orbit coupling of Pt. For the charge transport we measured the carrier mobility of photogenerated charges via the time of flight technique. We also determined the (longitudinal) spin relaxation time,  $T_2$  by pulsed EPR method, which allows us to calculate the spin diffusion coefficient  $D_s$  from  $\lambda_s$ . Finally we relate  $D_s$  to the charge diffusion coefficient  $D_c$ , which is determined from the charge mobility measurements.

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