

Abstract Submitted
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Semiconducting Organic Thin Film Devices with Large Magnetoresistance Y. SHENG, Ö. MERMER, Dept. of Phys. & Astr., Univ. of Iowa, G. VEERARAGHAVAN, Dept of Elec. & Comp. Engr., Univ. of Iowa, T.D. NGUYEN, Dept. of Phys. & Astr., Univ. of Iowa, T.L. FRANCIS, OMR Sensors Inc., Dubuque, Iowa, M. WOHLGENANNT, Dept. of Phys. & Astr., Univ. of Iowa — A comprehensive study on a recently discovered, large magnetoresistance (MR) effect in sandwich devices comprised of nonmagnetic electrodes and organic thin films is performed. Devices were fabricated from pi-conjugated polymers and small molecular weight compounds in combination with different electrode materials, and characterized extensively at different voltages, temperatures, and at weak magnetic fields from DC up to 100 kHz in frequency. The MR effect shows only weak temperature dependence and is independent of the sign and direction of the magnetic field. The effect reaches up to 10% in a magnetic field of 10 mT at room temperature. To illustrate a potential application of the effect, we demonstrate a prototype organic LED (OLED) touchscreen using the MR effect. To the best of our knowledge, the discovered effect is not adequately described by any of the MR mechanisms known to date.

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