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Frequency dependence of magnetoresistance in MEH-PPV THADDEE KAMDEM DJIDJOU, THO NGUYEN, Z. VALY VARDENY, ANDREY ROGACHEV, University of Utah — The organic magnetoresistance (OMAR) in organic light emitting diodes (OLED) made of MEH-PPV was investigated by means of DC transport and the admittance spectroscopy in the range of 1 Hz to 10 MHz at room temperature. The measurements were carried out on unipolar and bipolar OLEDs made of pristine MEH-PPV as well as MEH-PPV with traps introduced by the UV light irradiation. We found that in bipolar, UV-exposed OLEDs, the magnitude of magnetoresistance effect in real part of admittance increases with DC bias, reaches very high value of 35 % (in the field 30mT) at bias 4.8 V and decreases at higher bias voltages. Also, we observed that the cutoff frequency of OMAR effect monotonically increases with DC bias voltage. The cutoff has extrinsic origin and is likely caused by a dissipative process related to the reorientation of permanent dipoles. At the highest tested bias voltage 6.7 V, we were able to detect the OMAR at the highest frequency of our system, 10 MHz. We have found that imaginary part of the admittance is also affected by magnetic field. The effect of magnetic field on dynamical capacitance of the device at low frequencies is very strong and opens up a possibility of using these devices as magnetic field sensors.

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