

Abstract Submitted
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Large Magnetoresistance at High Bias Voltage in Double-layer Organic Spin Valves¹ R. C. SUBEDI, S. H. LIANG, R. GENG, Department of Physics Astronomy, University of Georgia, Athens, GA 30602, USA, Q.T. ZHANG, L. LOU, J. WANG, School of Materials Science and Engineering, Nanyang Technological University, Singapore 639798, Singapore, X. F. HAN, Beijing National Laboratory of Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing 100190, China, T. D. NGUYEN, Department of Physics Astronomy, University of Georgia, Athens, GA 30602, USA — We report studies of magnetoresistance (MR) in double-layer organic spin valves (DOSV) using tris (8-hydroxyquinolino) aluminum (Alq₃) spacers. The device exhibits three distinct resistance levels depending on the relative magnetizations of the ferromagnetic electrodes. We observed a much weaker bias voltage dependence of MR in the device compared to that in the conventional organic spin valve (OSV). The MR magnitude reduces by the factor of two at 0.7 V bias voltage in the DOSV compared to 0.02 V in the conventional OSV. Remarkably, the MR magnitude reaches 0.3% at 6 V bias in the DOSVs, the largest MR response ever reported in OSVs at this bias. Our finding may have a significant impact on achieving high efficient bipolar OSVs strictly performed at high voltages.

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