Abstract Submitted
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Molecular Beam Epitaxy Growth of Organic Spin Valves[1] K. PI, W. WANG, R. THAMANKAR, Y. CHYE, Y. F. CHIANG, Y. LI, R. K. KAWAKAMI, UC Riverside, Department of Physics and Astronomy — Spin-polarized transport across organic semiconductors has recently been demonstrated in organic spin valves consisting of ferromagnet(FM)/Alq_3/FM trilayers [a]. Organic semiconductors are interesting for spintronics due to their low spin-orbit coupling (which could in principle be tuned via chemical synthesis) and opto-electronic coupling to spin. We are utilizing molecular beam epitaxy (MBE) deposition through shadow masks to fabricate Co/Alq_3/Fe devices on MgO(001) substrates. Furthermore, we have developed the capability to perform variable temperature magnetotransport measurements without removing the sample from UHV. We find that for Alq_3 thickness below 100 nm, the sample exhibits linear I-V curves indicating a short across the Alq_3 layer, consistent with previous studies [a]. This is likely due to the interdiffusion of Co as the top electrode is deposited onto the Alq_3. By employing cryogenic techniques during top electrode growth, we are able to reduce the effects of Co diffusion and the formation of pinholes. We will report our progress on the in situ magneto-transport measurements to investigate spin-polarized transport in our devices. (a) Z. H. Xiong, et.al. Nature 427, 821 (2004).

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