

Abstract Submitted
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Hot electron spin transport in C₆₀ fullerene¹ LUIS EDUARDO HUESO, CIC nanoGUNE AND IKERBASQUE, Basque Foundation for Science, MARCO GOBBI, AMILCAR BEDOYA-PINTO, FEDERICO GOLMAR, ROGER LLOPIS, CIC nanoGUNE, FELIX CASANOVA, CIC nanoGUNE AND IKERBASQUE, Basque Foundation for Science — Carbon-based molecular materials are interesting for spin transport application mainly due to their small sources of spin relaxation [1]. However, spin coherence lengths reported in many molecular films do not exceed a few tens of nanometers [2]. In this work we will present results showing how hot spin-polarized electrons injected well above the Fermi level in C₆₀ fullerene films travel coherently for hundreds of nanometers. We fabricated hot-electron vertical transistors, in which the current created across an Al/Al₂O₃ junction is polarized by a metallic Co/Cu/Py spin valve trilayer and subsequently injected in the molecular thin film. This geometry allows us to determine the energy level alignment at each interface between different materials. Moreover, the collector magnetocurrent excess 85%, even for C₆₀ films thicknesses of 300 nm. We believe these results show the importance of hot spin-polarized electron injection and propagation in molecular materials. [1] V. Dediu, L.E. Hueso, I. Bergenti, C. Taliani, *Nature Mater.* 8, 707 (2009) [2] M. Gobbi, F. Golmar, R. Llopis, F. Casanova, L.E. Hueso, *Adv. Mater.* 23, 1609 (2011)

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