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Spin-Polarized Electron Transport through Nanometer-Scale Al Grains LIYUAN ZHANG, School of Physics.Georgia Tech — We had investigated the spin-polarized electron tunnelling through ensembles of nanometer scale Al grains embedded between two Co-reservoirs at 4.2K, and observed tunnelling-magnetoresistance (TMR) and the Hanle effect. The Spin-coherence time ($T2$), measured from the Hanle effect, is around nanoseconds. Fast dephasing is attributed to electron spin-precession in the local fringing fields. Dephasing does not destroy TMR, in contrast to spin-relaxation. TMR is strongly asymmetric with bias voltage, which we explain by spin-relaxation.

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