Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Magneto-transport in superconductor - half-metal - superconductor junctions[1] ADRIAN BALAN, XAVIER PALERMO, ANKE SANDER, Unite Mixte CNRS-THALES, Universite Paris Saclay, Palaiseau, France, DAVID SANCHEZ, GFMC, Universidad Complutense, Madrid, Spain, VICTOR RUOCO, Unite Mixte CNRS-THALES, Universite Paris Saclay, Palaiseau, France, JACOBO SANTAMARIA, GFMC, Universidad Complutense, Madrid, Spain, JAVIER VILLEGAS, Unite Mixte CNRS-THALES, Universite Paris Saclay, Palaiseau, France — Proximity-induced superconducting correlations can survive in half-metallic (HM) ferromagnets over relatively long distances, despite the nearly 100% spin polarization of their conduction electrons, owing to the generation of equal-spin triplet pairs. This effect allows for long-range, fully spin-polarized supercurrents, which hold much promise for superconducting spintronic applications. Here we experimentally investigate the conditions under which this type of long-range supercurrents are generated in the MH ferromagnet LaCaMnO3, in junctions in which this material is sandwiched in between different types of superconductors, and where the thickness of the HM spacer is more than one order of magnitude higher than the coherence length of the singlet pairs. We will describe the fabrication techniques for those junctions, and show transport experiments in which the signatures of a triplet supercurrents include a periodic modulation of the conductance as a function of the applied magnetic field.

[1]Work supported by the ERC grant N 64710 and French ANR grant ANR-15-CE24-0008-01

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Date submitted: 10 Nov 2016 Electronic form version 1.4