

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/43299> holds various files of this Leiden University dissertation

Author: Voltan, Stefano

Title: Inducing spin triplet superconductivity in a ferromagnet

Issue Date: 2016-09-29

Stellingen

Behorend bij het proefschrift

Inducing spin triplet superconductivity in a ferromagnet

1. It is dangerous to calculate the critical thickness for the occurrence of stripe domains in permalloy by determining the magnetic anisotropy constant from a magnetization measurement. *Chapter 3 of this thesis.*
2. Understanding the mechanism of generating spin triplet correlations in CrO₂ requires knowledge of the interface transparency between CrO₂ and the stack of layers which produce the triplets. A spin valve geometry is better suited to tackle this issue than a junction geometry. *Chapter 5 of this thesis.*
3. The CrO₂-based triplet spin valve with a superconducting MoGe layer of 50 nm is surprisingly efficient when taking into account that the S-layer thickness is about ten times the superconducting coherence length, which for MoGe is about 5 nm. *Chapter 5 of this thesis.*
4. In SNF/N-F/FNS Josephson junctions, the effective length of the coupling region cannot be obtained from summing the distance of the electrodes and the London penetration depth of the superconductor. *Chapter 7 of this thesis.*
5. In order to give credibility to superconducting spintronics as a reliable technology and to boost the development of applications, it is necessary to focus on experiments that directly show the effects of the spin-polarized nature of the supercurrent (e.g. spin-transfer torque, domain-wall motion). *J. Linder and J. W. A. Robinson, Nat. Phys. 11, 307 (2015).*
6. Experiments on half-metallic ferromagnetic manganites such as La_{0.7}Ca_{0.3}MnO₃, in which long-range proximity effects are observed only up to a few tens of nanometers, show that CrO₂ is a very special half-metal. *M. Egilmez et al., EPL 106, 37003 (2014).*
7. For studies involving oxide thin films, the generality of the conclusions strongly depends on the spectrum of variations of growth parameters used in the study, such as the oxygen pressure. *J. Biscaras et al., Phys. Rev. Lett. 108, 247004 (2012).*
8. Finite-element micromagnetic simulations have become a reliable tool to make good qualitative and semi-quantitative predictions for complex multilayer magnetic systems, especially in a confined geometry. The simulations can also provide useful information that is not always easily accessible with experiments. *N. Banarjee et al., Nat. Commun. 5, 4771 (2014).*

9. Competition in science can serve as a stimulating factor, but too often it undermines the mission of science itself.
10. Fabrizio de André, a famous Italian songwriter, said: “A man without utopia, without dreams, without passions and eagerness would be a monstrous animal only made of instinct and reasoning, a kind of boar with a degree in pure mathematics”. Acquiring a significant amount of scientific knowledge is important to become a successful scientist, but it is certainly not sufficient to be a complete person.
11. Weather, food and aesthetics can be important elements to decide on the place where to live, but it is the people with whom you are going to share all of that which really makes the difference.

Stefano Voltan
Leiden, 29-09-2016