

DR. IR. REINOUD LAVRIJSEN

LIST OF PUBLICATIONS, PRESENTATIONS, SUPERVISED STUDENTS (AS PER OKTOBER 2016)

FIRST-AUTHOR

1. [Asymmetric magnetic bubble expansion under in-plane field in Pt/Co/Pt: Effect of interface engineering](#)
R. Lavrijsen, D.M.F. Harmann, A. van den Brink, Y. Yin, M. Verheijen, B. Barcones, R.A. Duine, H. J. M. Swagten, B. Koopmans
Phys. Rev. B **91**, 104414 (2015)
2. [Multi-bit operations in vertical spintronic shift registers](#)
R. Lavrijsen, J-H. Lee, A. Fernandez-Pacheco, D. Petit, R. Mansell, R.P. Cowburn
Nanotechnology **25**, 105201, (2014)
3. [Magnetic ratchet for 3-dimensional spintronics memory and logic](#)
R. Lavrijsen, J-H. Lee, A. Fernandez-Pacheco, D. Petit, R. Mansell, R.P. Cowburn
Nature **494**, 647-650, (2013)
4. [Asymmetric Pt/Co/Pt-stack induced sign-control of current-induced magnetic domain-wall creep](#)
R. Lavrijsen, P.P.J. Haazen, E. Mure, J.H. Franken, J.T. Kohlhepp, H.J.M. Swagten and B. Koopmans
Applied Physics Letters, **100**, 262408, (2012)
5. [Tuning the RKKY-interlayer exchange coupling between single perpendicularly magnetized CoFeB layers](#)
R. Lavrijsen, A. Fernandez-Pacheco, D. Petit, R. Mansell, J.H. Lee, R.P. Cowburn
Applied Physics Letters, **100**, 052411, (2012)
6. [Magnetism in \$\text{Co}_{80-x}\text{Fe}_x\text{B}_{20}\$: effect of crystallization](#)
R. Lavrijsen, P.V. Paluskar, C.T.J. Loermans, P.A. van Kruisbergen, J.T. Kohlhepp, H.J.M. Swagten and B. Koopmans.
Journal of Applied Physics, **109**, 093905, (2011)
7. [Enhanced -field driven domain-wall motion in Pt/Co₆₈B₃₂/Pt strips](#)
R. Lavrijsen, J.T. Kohlhepp, H.J.M. Swagten and B. Koopmans.
Applied Physics Letters, **98**, 132502, (2011)
8. [Fe:O:C grown by focused-electron-beam-induced deposition: magnetic and electric properties](#)
R. Lavrijsen, R. Cordoba, F. J. Schoenaker, T. Ellis, B. Barcones-Campo, J.T. Kohlhepp, H.J.M. Swagten, B. Koopmans, J.M. De Teresa, C. Magen, M.R. Ibarra, P. Trompenaars and J.J.L. Mulders.
Nanotechnology, **22**, 025302, (2011).
9. [Controlled domain wall injection in perpendicularly magnetized strips](#)
R. Lavrijsen, J.H. Franken, J. T. Kohlhepp, H. J. M. Swagten, B. Koopmans
Applied Physics Letters **96**, 222502, (2010)
10. [Reduced domain wall pinning in ultrathin Pt/Co_{100-x}B_x/Pt with perpendicular magnetic anisotropy](#)
R. Lavrijsen, G.Malinowski, J.H. Franken, J. T. Kohlhepp, H. J. M. Swagten, B.

Koopmans, M. Czapkiewicz, T. Stobiecki
Applied Physics Letters 96, 022501, (2010)

CO-AUTHOR

11. [Systematic layer-by-layer characterisation of multilayers for three-dimensional data storage and logic](#)
 D. Petit, R. Lavrijsen, J. H. Lee, R. Mansell, A. Fernandez-Pacheco, R. P. Cowburn
Nanotechnology 27, 155203, (2016)
12. [Thickness dependence of the interfacial Dzyaloshinskii-Moriya interaction in inversion symmetry broken systems](#)
 J. Cho, N-H. Kim, S. Lee, J-S. Kim, R. Lavrijsen, A. Solignac, Y. Yin, D-S. Han, N. J. J. van Hoof, H. J. M. Swagten, B. Koopmans, C-Y. You
Nature Communications 6, 7635, (2015)
13. [A robust soliton ratchet using combined antiferromagnetic and ferromagnetic interlayer couplings](#)
 R. Mansell, R. Lavrijsen, A. Fernandez-Pacheco, D. C. M. C. Petit, J. H. Lee, B. Koopmans, H. J. M. Swagten, R. P. Cowburn
Appl. Phys. Lett. 106, 092404 (2015)
14. [Magnetic properties and interlayer coupling of epitaxial Co/Cu films on Si](#)
 R. Mansell, D. Petit, A. Fernandez-Pacheco, R. Lavrijsen, J.H. Lee, R. P. Cowburn
Journal of Applied Physics, 116, 063906, (2014)
15. [Soliton propagation in micron-sized magnetic ratchet elements](#)
 J.-H. Lee, D. Petit, R. Lavrijsen, A. Fernandez-Pacheco, R. Mansell, R.P. Cowburn
Applied Physics Letters, 104, 232404, (2014)
16. [Beam-Induced Fe Nanopillars as Tunable Domain-Wall pinning Sites](#)
 J.H. Franken, M.A.J. van der Heijden, T.H. Ellis, R. Lavrijsen, C. Daniels, D. McGrouther, H.J.M. Swagten, B. Koopmans
Advanced Functional Materials 24, 23, 3508-3514, (2014)
17. [Domain Imaging during soliton propagation in a 3D magnetic ratchet](#)
 J.-H. Lee, R. Mansell, D. Petit, A. Fernandez-Pacheco, R. Lavrijsen, R. P. Cowburn
SPIN, Vol 3, No. 4, 134001, (2013)
18. [Domain wall depinning governed by the spin Hall effect](#)
 P.P.J. Haazen, E. Mure, J.H. Franken, R. Lavrijsen, H.J.M. Swagten, B. Koopmans
Nature Materials 12, 299-303, (2013)
19. [Magnetic states in low-pinning high-anisotropy magnetic nanostructures suitable for dynamic imaging](#)
 F. Buttner, C. Moutafis, A. Bisig, P. Wohlhuter, C.M. Gunther, J. Mohanty, J. Guilhufe, M. Schneider, C.V. Schmising, S. Schaffert, B. Pfau, M. Hantschmann, M. Riemeier, M. Emmel, S. Finizio, G. Jakob, M. Weigand, J. Rhensius, J.H. Franken, R. Lavrijsen, H.J.M Swagten, H. Stoll, S. Eisebitt, M. Klaui
Physical Review B, 87, 134422, (2013)
20. [Controllable nucleation and propagation of topological magnetic solitons in CoFeB/Ru ferrimagnetic superlattices](#)
 A. Fernandez-Pacheco, D. Petit, R. Mansell, R. Lavrijsen, J.H. Lee, R.P. Cowburn
Physical Review B, 86, 104422, (2012)
21. [Giant anomalous Hall effect in Fe-based microwires grown by focused-electron-beam-induced deposition](#)
 R. Cordoba, R. Lavrijsen, A. Fernandez-Pacheco, M.R. Ibarra, F. J. Schoenaker, T.

- Ellis, B. Barcones-Campo, J.T. Kohlhepp, H.J.M. Swagten, B. Koopmans, J.J.L. Mulders and J.M. De Teresa
Journal of Physics D: Applied Physics, **45**, 035001, (2012)
22. [Domain-Wall pinning by local control of anisotropy in Pt/Co/Pt strips](#)
 J.H. Franken, M. Hoeijmakers, R. Lavrijsen, H.J.M. Swagten
Journal of Physics: Condensed matter, **24**, 024216, (2012)
23. [Precise control of domain wall injection and pinning using helium and gallium focused ion beams](#)
 J.H. Franken, M. Hoeijmakers, R. Lavrijsen, J. T. Kohlhepp, H. J. M. Swagten, B. Koopmans
Journal of Applied Physics, **109**, 07D504, (2011)
24. [Tunable magnetic domain wall oscillator at an anisotropy boundary](#)
 J.H. Franken, R. Lavrijsen, J. T. Kohlhepp, H. J. M. Swagten, B. Koopmans
Applied Physics Letters, **98**, 102512, (2011)
25. [Spin motive forces due to magnetic vortices and domain walls](#)
 M.E. Lucassen, G.C.F.L. Kruis, R. Lavrijsen, H.J.M. Swagten, B. Koopmans and R.A. Duine
Physical Review B, **84**, 014414 (2011)
26. [Correlation between Magnetism and Spin-Dependent Transport in CoFeB Alloys](#)
 P.V. Paluskar, R. Lavrijsen, M. Sicot, J. T. Kohlhepp, H.J.M. Swagten, and B. Koopmans
Physical Review Letters **102**, 016602 (2009)
27. [Magnetization Dynamics and Gilbert damping in ultrathin Co₄₈Fe₃₂B₂₀ films with out-of-plane anisotropy](#)
 G. Malinowski, K.C. Kuiper, R. Lavrijsen, H.J.M. Swagten, B. Koopmans
Applied Physics Letters **94**, 102501 (2009)
28. [Tunneling spin polarization and annealing of Co₇₂Fe₈B₂₀](#)
 H.J.M. Swagten, P.V. Paluskar, R. Lavrijsen, J.T. Kohlhepp, B. Koopmans
Journal of Magnetism and Magnetic Materials **310** (2, Pt. 3), 2012-2014 (2007)

IN-PREPARATION (AS FIRST OR CO-AUTHOR)

- a) **R. Lavrijsen et al.** - Anomalous magnetic behavior of Pt / Co / Ir / Pt; competing exchange and Dzyaloshinskii-Moriya interaction? *In Preparation*
- b) **R. Lavrijsen et al.** Electric field effect on the RKKY coupling in ultrathin magnetic films. *In Preparation*
- c) **J. Lucassen et al.** Using spin polarized tunnelling to quantify the Spin Hall Effect. *In Preparation*

PRESENTATIONS

- i. **(Invited) On spin-orbit torques, chiral magnetization textures and e-control of magnetization in ultrathin multilayers**
R. Lavrijsen, H.J.M. Swagten, B. Koopmans
 International Conference on Nanoscale Magnetism, Turkey
 (September 2016) cancelled due to political situation in Turkey
- ii. **Manipulating the RKKY coupling strength by electric fields**
R. Lavrijsen, M. Lalieu, R. Raijmakers, H.J.M. Swagten, B. Koopmans

- IEEE 2016 International Symposium On Metallic Multilayers, Uppsala, Sweden
(June 2016)
- iii. **(Invited) Asymmetric exchange in Pt/Co/Ir/Pt multilayers**
R. Lavrijsen, R. Duine, H.J.M. Swagten, B. Koopmans
Wiesendanger group Symposium, Hamburg, Germany
(June 2015)
- iv. **(Invited) Domain-walls, magnetic bubbles, and the Dzyaloshinskii-Moriya interaction?**
R. Lavrijsen, D. Hartmann, R. Duine, H.J.M. Swagten, B. Koopmans
SPRING2015, Spring meeting EMRS, Lille, France
(May 2015)
- v. **(Invited) Symmetric exchange and charging the interlayer exchange coupling**
R. Lavrijsen, D. Hartmann, R. Duine, H.J.M. Swagten, B. Koopmans
Thin Film Magnetization Group Symposium, Cambridge, UK
(March 2015)
- vi. **Tuning asymmetric exchange: towards an ideal racetrack memory?**
R. Lavrijsen, H.J.M. Swagten, B. Koopmans
COBRA symposium, TU/e, Eindhoven, The Netherlands
(February 2015)
- vii. **(Invited) Domain-wall depinning governed by the spin Hall effect and Dzyaloshinskii-Moriya interaction**
R. Lavrijsen, J.H. Franken, D. Hartmann, R. Duine, H.J.M. Swagten, B. Koopmans
59th Annual Magnetism & Magnetic Materials Conference, Honolulu, Hawaii
(November 2014)
- viii. **(Invited) On domain-walls and spin-orbit torques**
R. Lavrijsen, H.J.M. Swagten, P.J. Haazen, E. Mure, J.H. Franken, B. Koopmans
Deutsche Physikalische Gesellschaft Spring Meeting, Dresden, Germany
(April 2014)
- ix. **On spin-orbitronics and 3D soliton ratchets**
R. Lavrijsen, H.J.M. Swagten, P.J. Haazen, E. Mure, J.H. Franken, B. Koopmans, J-H. Lee, A. Fernandez-Pacheco, D. Petit, R. Mansell, R.P. Cowburn
Physics@FOM Meeting, Veldhoven, The Netherlands
(January 2014)
- x. **(Invited) On spin-orbitronics, soliton ratchets and domain walls**
R. Lavrijsen; Workshop: Spintronics: Its Frontiers, Challenges and Opportunities
Nanyang Technological University Singapore, Singapore
(January 2014)
- xi. **(Invited) Domain-wall depinning governed by the spin Hall effect**
R. Lavrijsen, H.J.M. Swagten, P.J. Haazen, E. Mure, J.H. Franken, B. Koopmans
Joint European Magnetism Symposia, Rhodes, Greece
(August 2013)
- xii. **(Invited) Multiple soliton propagation through a magnetic superlattice**
R. Lavrijsen, J-H. Lee, A. Fernandez-Pacheco, D. Petit, R. Mansell, R.P. Cowburn
IEEE 2013 International Symposium On Metallic Multilayers, Kyoto, Japan
(May 2013)

- xiii. *(Invited)* Towards fully 3-dimensional spintronics - MRAM**
R. Lavrijsen, J-H. Lee, A. Fernandez-Pacheco, D. Petit, R. Mansell, R.P. Cowburn
 IMEC, Leuven, Belgium
(December 2012)
- xiv. 3D spintronics: Perpendicularly magnetized soliton ratchet**
R. Lavrijsen, J-H. Lee, A. Fernandez-Pacheco, D. Petit, R. Mansell, R.P. Cowburn
 Joint European Magnetic Symposia, Parma, Italy
(September 2012)
- xv. Single perpendicularly magnetized CoFeB layers for 3D spintronics**
R. Lavrijsen, A. Fernandez-Pacheco, D. Petit, J-H. Lee, R. Mansell, R.P. Cowburn
 Intermag, IEEE International Magnetism Conference, Vancouver, Canada
(May 2012)
- xvi. Domain walls in perpendicularly magnetized stripes violating spin-transfer torque?**
R. Lavrijsen, J.T. Kohlhepp, H.J.M. Swagten, B. Koopmans
 55th Annual Conference on Magnetism & Magnetic Materials, Atlanta, USA
(November 2010)
- xvii. *(Invited)* Domain walls in perpendicularly magnetized stripes violating spin-transfer torque?**
R. Lavrijsen, J.T. Kohlhepp, H.J.M. Swagten, B. Koopmans
 IEEE 2010 International Symposium On Metallic Multilayers, Berkeley, USA
(September 2010)
- xviii. Perpendicular Pt / CoFeB / Pt, a tunable system for domain wall dynamics**
R. Lavrijsen, G. Malinowski, J.T. Kohlhepp, H.J.M. Swagten, B. Koopmans
 53rd Annual Conference on Magnetism & Magnetic Materials, Austin, Texas, USA
(November 2008)

EXTERNAL (COLLABORATION)

- xix. Sputtered Hematite thin films for photo-electrochemical solar fuel conversions**
 A. Bieberle-Hutter, R. Sinha, R. Lavrijsen, R. van de Sanden
 1st International Solar Fuels Conference, Uppsala, Sweden
(April 2015)
- xx. Nanostructured Thin Films by High Ion Flux He Plasma Exposure and Their Photoelectrochemical Properties**
 A. Bieberle-Hütter, I. Tanyeli, R. Sinah, R. Lavrijsen, R. van de Sanden
 Solar Fuel Conference, Mallorca, Spain
(March 2015)

SUPERVISED MASTER/BACHELOR STUDENTS

1. M.Sc. Michael Beljaars (2008), *Electron beam induced deposition of Iron*
2. B.Sc. Joris Jongen (2008), *Quantitative Magnetic Force Microscopy*
3. B.Sc. Rik Paesen (2008), *Field driven and current induced domain wall motion*
4. M.Sc. Coen Loermans (2009), *Magnetic properties of perpendicularly magnetized ultrathin Pt/CoFeB/Pt films*

5. M.Sc. Paul Janssen (2009), *The nanostencil process*
6. B.Sc. Tim Weekenstro (2009), *Ion Beam Milling*
7. B.Sc. Roger Bosch (2009), *Determination of the magnetic properties of EBID-deposited Fe nanowires through the AMR effect*
8. B.Sc. Can Avci (2009), *Magnetic characterization of Co/Pt single layer with perpendicular magnetization*
9. M.Sc. Frank Schoenaker (2010), *Exploring the fabrication of ferromagnetic nanostructures by Electron Beam Induced Deposition*
10. M.Sc. Jeroen Franken (2010), *Domain wall motion in perpendicularly magnetized ultrathin Pt/CoFeB/Pt films*
11. M.Sc. Paul Soto (2010), *Nano-stencil fabrication for spin-torque devices*
12. M.Sc. Geerit Kruis (2011), *Racing domain walls*
13. M.Sc. Tim Ellis (2011), *Novel Deposition of Magnetic Nanostructures*
14. B.Sc. Mark Lalieu (2012), *Towards a working 3D data storage device*
15. B.Sc. Dion Hartmann UU (2014), *Domain-wall motion in materials with perpendicularly magnetic anisotropy*
16. M.Sc. Mark Lalieu (2014), *Charging the interlayer exchange coupling*
17. M.Sc. Juriaan Lucassen (2015), *Determining the Spin Hall Effect using superconducting tunnelling spectroscopy*
18. M.Sc. Dorris Slapak (2016), *Growing BaTiO₃ for future magnetic memory devices*
19. M.Sc. Guido Hendriks (2016), *Synthetic-Multiferroic heterostructures with the Spin Hall Effect*
20. Pim van Nispen (M.Sc. expected 2016), *Characterising the Dzyaloshinskii-Moriya effect by magnetic bubble expansion*
21. Rens Raijmakers (M. Sc. Expected 2016), *Tunable interlayer exchange coupling*
22. Paul de Brouwer (M. Sc. Expected 2017), *Tunable interlayer exchange coupling*

Non-refereed articles (3)

1. **Driedimensionale Chips**
R. [Lavrijsen](#), *N! Periodieke uitgave VENI*, 2014
2. **Driedimensionale Chips!**
R. [Lavrijsen](#), *NTvN*, 2014
3. **MgO als Tunnel Barriere**
R. Lavrijsen, H.J.M. Swagten, P.V. Paluskar, B. Koopmans, *NEVACblad*, 2008

Other (2)

1. **Magneetjes bouwen**
Antje Veld, R. [Lavrijsen](#), *Experiment NL*, 2015
2. **Een spintronics flatgebouw**
Tom Jeltjes, R. [Lavrijsen](#), *CURSOR, TU/e*, 2014
3. **Nationale Wetenschapsquiz (National TV, to be broadcasted on Christmas day)**
VPRO, December 2016