

## CURRICULUM VITAE of Christian Rinaldi

### PERSONAL INFORMATION

Born in Como, 31/07/1984  
Civil status: married, two children  
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### EDUCATION

2003: Diploma (Perito industriale) in Computer Science (mark 100/100 cum laude)  
2009: Master degree in Physics Engineering at Politecnico di Milano (mark 110/100 cum laude)  
2013: PhD in Physics at Politecnico di Milano (Prof. R. Bertacco), cum laude (top 10% of the students)

### PROFESSIONAL APPOINTMENTS

2012 **Visiting Ph.D.** at the Institute of Physics - Academy of Science of Czech Republic in the group of Prof. Thomas Jungwirth

**Postdoctoral Fellow**, LNESS – Department of Physics, Politecnico di Milano (Italy)

01/2013-09/2013 *Microfabrication and characterization of spintronic devices based on ferroelectric layers* (project funded by Fondazione Cariplo)

10/2013-09/2014 *Development of spintronics transducer for magnetic biosensors* (project funded by Regione Lombardia)

10/2014 – 09/2016 **Postdoctoral Fellow**, Department of Physics, Politecnico di Milano (Italy)  
*Storing information in spintronics devices based on antiferromagnetic materials* (project funded by Fondazione Cariplo)

2015-now **Fellowship**: Italian Institute for Photonics and Nanotechnology IFN-CNR Milano

10/2016-10/2019 Fixed-term **“Junior” Researcher (RTDA)**, Polifab – Dip. di Fisica - Politecnico di Milano

From 11/2019 Fixed-term **“Senior” Researcher (RTDB)**, Polifab – Dip. di Fisica - Politecnico di Milano

### RESEARCH ACTIVITY

C.R. has 11 years of experience in magnetic materials and Spintronics. His activity focuses on the electric control of spin physics in heterostructures comprising semiconductors, (anti-)ferromagnets, functional oxides and others. His general aim is the discovery of novel physical properties in multifunctional materials for the realization of innovative nanoscale electronic devices. He is expert in: growth of heterostructures by molecular beam epitaxy; characterization by electron spectroscopies and diffraction (XPS, XPD, LEED, RHEED); investigation of magnetic properties (VSM, MOKE) and ferroelectricity (PFM, PUND); fabrication of devices by optical and e-beam lithography; charge/spin transport measurements.

During the Ph.D., C.R. focused studied the spin optical orientation in Germanium within Fe/MgO/Ge heterostructures, with the development of integrated spin-photodiodes able to detect the light helicity [C. Rinaldi et al., Adv. Mater. 24, 3037 (2012); C. Rinaldi, Phys. Rev. B 90, 161304(R) (2014)]. His work revealed for the first time long spin lifetime for holes under the application of a voltage bias.

He was visiting PhD at the Institute of Physics ASCR, v. v. i. (FZU), Academy of Sciences of the Czech Republic, working in the Group of Prof. Tomas Jungwirth. He studied the properties of CuMnAs, the semiconductor which paved the way to antiferromagnets spintronics [Nature Commun. 4, 2322(2016)].

C.R. worked on the non-volatile electric control of magnetization in ferroelectric/ferromagnet systems (Fe/BaTiO<sub>3</sub>) [Nature Commun. 5, 3404 (2014); Adv. Electr. Mater. 2, 1600085 (2016)].

**He pioneered the study of ferroelectric Rashba semiconductors** to achieve the non-volatile electric control of spin transport in semiconductors. C.R. is author of the first spectroscopic investigation of Rashba effect in GeTe by SARPES [Adv. Mater. 28, 560 (2016)] and of the first demonstration of sizeable spin-charge conversion phenomena in GeTe [APL Mater. 4, 032501 (2016)]. He demonstrated the reversibility of the Rashba spin texture in GeTe by ferroelectric switching [C. Rinaldi et al., Nano Letters 18, 2751 (2018)] and the **ground-breaking concept of ferroelectric control of spin-charge conversion, paving the way to a new generation of fully reconfigurable computing devices based on ferroelectric Rashba semiconductors**. Finally, C.R. worked on the growth and characterization of Fe/ and Co/Sb<sub>2</sub>Te<sub>3</sub> for the investigation of spin-to-charge conversion in topological insulators.

### **BIBLIOMETRIC INDICATORS**

58 publications in international journals

[including 1 Nature Electronics, 3 Adv. Mater. (impact factor 27.4), 2 Nature Commun. (if 13.0), 1 Nano Letters (if 11.2), 1 Phys. Rev. Lett. (if 8.4), 1 single-author paper, 1 invited APL Mater. (if 4.1)]

- H-index: 14 ([Scopus](#) and [WoS](#)), 16 ([Google Scholar](#))

- Total citations: > 880 ([Scopus](#) and [WoS](#))

### **AWARDS AND OTHER HONORS**

- First prize "Art in Magnetism" at Intermag 2018 (co-author)
- Cover of Adv. Funct. Mater. (2021), Nano Letters (May 2018), Adv. Electron. Mater. (July 2016).
- Cover of the single-author paper C. Rinaldi, Nuovo Cimento C 36, 71 (2013).
- Editor's pick One of the 10 most accessed articles on APL Materials in 2016.
- Travel grants for the best contribution at the int. conf. on Magnetism ICM2012, Busan, Korea, 2012.
- Best oral contribution in the session of condensed matter physics at the XCVIII Congress of the Italian physical society (SIF), Napoli, 2012.

### **CONFERENCES**

C.R. participated in 13 international, 8 national conferences and 2 workshops in the field of Ferroelectrics, Magnetism, Spintronics and materials science (MMM, JEMS, INTERMAG, SPIE, EMRS, etc.). He was speaker of more than 22 oral contributions and several posters. CR had **11 invited talks** and **1 keynote speech**:

- 2021-09 Intern. conference German DPG 2021 (Berlin)
- 2021-08 Intern. conference SPIE 2021 Nanoscience+Engineering (San Diego, CA, USA)
- 2021-03 Invited research seminar @ Memristors based on unconventional ferroelectrics (online)
- 2020-01 Invited seminar at University of North Texas (Texas, USA)
- 2019-11 Magnetism and Magnetic Materials (Las Vegas, NV, USA)
- 2018-09 NanoInnovation 2018 (Rome, Italy)
- 2018-08 Intern. conference SPIE 2018 Nanoscience+Engineering (San Diego, CA, USA)
- 2018-06 Intern. conference on nanostructured materials NANO 2018 (Hong Kong)
- 2017-10 Intern. Workshop Magnetic Coupling in Nanostructured Materials MaCMat (Rome, IT)
- 2017-09 Fall meeting of the European Materials Research Society (EMRS2017 Fall, Warsaw, PO)
- 2014-08 Intern. conference SPIE 2014 Nanoscience+Engineering (San Diego, CA, USA)
- 2012-06 Lanna meeting about Spintronics (Prague, CZ)

The scientific activity was also presented by coworkers in >30 speeches in international conferences, with other +7 invited talks.

### **PATENTS**

1 patent application (Dispositivo rilevatore ottico spintronico. MI2011A000211).

### **GRANTS**

08/2018-02/2023 - Ministero dell'Università e della Ricerca (**MUR**), call PRIN 2017. "TWEET: ToWards fErroElectricity in Two-dimensions". **Unit coordinator** (national coordinator: Silvia Picozzi, CNR-SPIN Chieti, IT), funding **650 k€**.

2018-2019 - **Fondazione Cariplo** and Regione Lombardia, Cariplo ERC. "Electric Control Of Spin transport in ferroelectric Rashba semiconductors" (ECOS grant n. 2017-1622). **Principal investigator**, fund **120 k€**.

As participant:

- 2021-2022 - Spanish National Research Council, "Electrocaloric effects in CMOS compatible ferroelectric oxides for cooling application". Unit coordinator (PI Dr. Ignasi Fina, ICMB, Barcellona). Fund 24 k€.

- 2014-2017 Fondazione Cariplo. Magnetic Information Storage in Antiferromagnet Spintronic Devices (MAGISTER, grant n. 2013-0726, 316 k€). Role: responsible of the experimental activity for the realization of innovative devices comprising antiferromagnetic materials.
- 2014-2017 Cariplo, Spin optoElectronics ARCHitectures based on IV group compounds (SEARCH IV, grant n. 2013-0623, 353 k€). Role: Fabrication and characterization of spin optoelectronic devices based on Ge.
- 2012-2014 Reg. Lombardia-MIUR and EU, Development of *extremely sensitive and compact lab-on-chip diagnostic platform* for the detection of pathogens in agrifood by spintronic transducers (LOCSENSE, 1.5 M€). Role: development of magnetic sensors.
- 2011-2013 Cariplo, Electric control of magnetization (ECOMAG, n. 2010-0584, 353 k€). Role: control of magnetization in interfacial multiferroics (interfaces between ferroelectrics and ferromagnets)

## INTERNATIONAL COLLABORATIONS

CNR-SPIN, L'Aquila (Italy)  
 Unité Mixte de Physique CNRS/Thalès (France)  
 University of Grenoble - CEA (France)  
 ETH Zürich  
 Elettra Sincrotron IOM-CNR  
 Trinity College, Dublin (Ireland)  
 ICMAB, Barcellona  
 Paul-Drude-Institut, Berlin (Germany)  
 CNR-IMM, Agrate Brianza (Italy)

Dr. Silvia Picozzi  
 Prof. Manuel Bibes  
 Dr. L. Vilà and Prof. J.-P. Attané  
 Prof. Pietro Gambardella  
 G. Panaccione, I. Vobornik  
 Prof. S. Sanvito  
 Dr. Ignasi Fina, Prof. J. Fontcuberta  
 Dr. R. Calarco, Dott. S. Cecchi  
 Dr. E. Longo

## TEACHING

2010-2017 Teaching assistant, basic physics for engineers.  
 2018-2020 Assistant Professor in Electromagnetism and waves for Civil Engineering.  
 2020-now Assistant Professor in Experimental Physics (Classical mechanics, thermodynamics)

## COMMISSIONS OF TRUST

- Member of the Council of the Italian Association of Magnetism (AIMagn) and developer of the website
- Responsible for data storage at the Department of Physics of Politecnico di Milano
- Topic editor (Spintronics) of the journal Electronics (ISSN 2079-9292)
- Guest editor for the special issue "Spin Optoelectronics" in Electronics

## ORGANIZATION OF SCIENTIFIC MEETINGS

01-2020, Milano - Organizer of the two-day workshop "Electric control of spin transport" with 15 eminent international academic guests.

## REVIEWER

Referee for several scientific journals: J. Phys. D Condensed Matter, Applied Physics Letters, Thin Solid Films, ACS Appl. Mater & Interf., npg Asia Materials and npj Materials (Nature family), J. Appl. Phys., Nanoletters, IEEE Magn. Lett. and others.

## OTHER

Currently supervision of 1 post doc, 1 Ph.D. student in Physics and two master student in Physics Engineering. He supervised 15 Bachelor, 8 Master, and 3 Ph.D. students.

## FIVE SELECTED PUBLICATIONS

- [1] S. Varotto, ..., and **C. Rinaldi**, Room-Temperature Ferroelectric Switching of Spin-to-Charge Conversion in Germanium Telluride, [Nature Electronics](#) **4**, 740 (2021).
- [2] **C. Rinaldi et al.**, Ferroelectric Control of the Spin Texture in GeTe, [Nano Letters](#) **18**, 2751 (2018).
- [3] M. Liebmann, **C. Rinaldi et al.**, Giant Rashba-Type Spin Splitting in Ferroelectric GeTe(111), [Adv. Mater.](#) **28**, 560 (2016).
- [4] L. Baldrati, **C. Rinaldi et al.**, Electrical Switching of Magnetization in the Artificial Multiferroic CoFeB/BaTiO<sub>3</sub>, [Adv. Electron. Mater.](#) **2**, 1600085 (2016).
- [5] G. Radaelli *et al.*, Electric control of magnetism at the Fe/BaTiO<sub>3</sub> interface, [Nature Commun.](#) **5**, 3404 (2014).

## FULL LIST OF PUBLICATIONS

- [1] S. Varotto, L. Nessi, S. Cecchi, J. Sławińska, P. Noël, S. Petrò, F. Fagiani, A. Novati, M. Cantoni, D. Petti, E. Albisetti, M. Costa, R. Calarco, M. Buongiorno Nardelli, M. Bibes, S. Picozzi, J.-P. Attané, L. Vila, R. Bertacco, and **C. Rinaldi**, *Room-Temperature Ferroelectric Switching of Spin-to-Charge Conversion in Germanium Telluride*, Nat. Electron. (2021).
- [2] M. Giacometti, F. Milesi, P. L. Coppadoro, A. Rizzo, F. Fagiani, C. Rinaldi, M. Cantoni, D. Petti, E. Albisetti, M. Sampietro, M. Ciardo, G. Siciliano, P. Alano, B. Lemen, J. Bombe, M. T. Nwaha Toukam, P. F. Tina, M. R. Gismondo, M. Corbellino, R. Grande, G. B. Fiore, G. Ferrari, S. Antinori, and R. Bertacco, *A Lab-On-Chip Tool for Rapid, Quantitative, and Stage-Selective Diagnosis of Malaria*, Adv. Sci. **8**, (2021).
- [3] C. Groppi, L. Mondonico, F. Maspero, C. Rinaldi, M. Asa, and R. Bertacco, *Effect of Substrate Preparation on the Growth of Lead-Free Piezoelectric (K<sub>0.5</sub>Na<sub>0.5</sub>)NbO<sub>3</sub> on Pt(111)*, J. Appl. Phys. **129**, (2021).
- [4] P. Makushko, E. S. Oliveros Mata, G. S. Cañón Bermúdez, M. Hassan, S. Laureti, C. Rinaldi, F. Fagiani, G. Barucca, N. Schmidt, Y. Zabala, T. Kosub, R. Illing, O. Volkov, I. Vladymyrskyi, J. Fassbender, M. Albrecht, G. Varvaro, and D. Makarov, *Flexible Magnetoreceptor with Tunable Intrinsic Logic for On-Skin Touchless Human-Machine Interfaces*, Adv. Funct. Mater. **31**, (2021).
- [5] M. Hassan, S. Laureti, C. Rinaldi, F. Fagiani, S. Varotto, G. Barucca, N. Y. Schmidt, G. Varvaro, and M. Albrecht, *Perpendicularly Magnetized Co/Pd-Based Magneto-Resistive Heterostructures on Flexible Substrates*, Nanoscale Adv. **3**, 3076 (2021).
- [6] M. Asa, C. Rinaldi, L. Nessi, D. Chrastina, D. Petti, E. Albisetti, R. Bertacco, and M. Cantoni, *Epitaxy and Controlled Oxidation of Chromium Ultrathin Films on Ferroelectric BaTiO<sub>3</sub> Templates*, J. Cryst. Growth **558**, (2021).
- [7] E. Longo, C. Wiemer, M. Belli, R. Cecchini, M. Longo, M. Cantoni, C. Rinaldi, M. D. Overbeek, C. H. Winter, G. Gubbiotti, G. Tallarida, M. Fanciulli, and R. Mantovan, *Ferromagnetic Resonance of Co Thin Films Grown by Atomic Layer Deposition on the Sb<sub>2</sub>Te<sub>3</sub> Topological Insulator*, J. Magn. Magn. Mater. **509**, (2020).
- [8] F. Motti, G. Vinai, V. Bonanni, V. Polewczyk, P. Mantegazza, T. Forrest, F. MacCherozzi, S. Benedetti, C. Rinaldi, M. Cantoni, D. Cassese, S. Prato, S. S. Dhesi, G. Rossi, G. Panaccione, and P. Torelli, *Interplay between Morphology and Magnetolectric Coupling in Fe/PMN-PT Multiferroic Heterostructures Studied by Microscopy Techniques*, Phys. Rev. Mater. **4**, (2020).
- [9] M. Asa, C. Rinaldi, R. Pazzocco, D. Petti, E. Albisetti, R. Bertacco, and M. Cantoni, *Electrical Readout of the Antiferromagnetic State of IrMn through Anomalous Hall Effect*, J. Appl. Phys. **128**, (2020).
- [10] S. Varotto, M. Cosset-Cheneau, C. Grezes, Y. Fu, P. Warin, A. Brenac, J.-F. Jacquot, S. Gambarelli, C. Rinaldi, V. Baltz, J.-P. Attane, L. Vila, and P. Noel, *Independence of the Inverse Spin Hall Effect with the Magnetic Phase in Thin NiCu Films*, Phys. Rev. Lett. **125**, (2020).
- [11] G. Franchini, A. S. Spinelli, G. Nicosia, I. Fumagalli, M. Asa, C. Groppi, C. Rinaldi, A. L. Lacaita, R. Bertacco, and C. Monzio Compagnoni, *Characterization and Modeling of Current Transport in Metal/Ferroelectric/Semiconductor Tunnel Junctions*, IEEE Trans. Electron Devices **67**, 3729 (2020).
- [12] E. Longo, C. Wiemer, R. Cecchini, M. Longo, A. Lamperti, A. Khanas, A. Zenkevich, M. Cantoni, C. Rinaldi, M. Fanciulli, and R. Mantovan, *Fe/Sb<sub>2</sub>Te<sub>3</sub> Interface Reconstruction through Mild Thermal Annealing*, Adv. Mater. Interfaces **7**, (2020).
- [13] E. Albisetti, G. Scaramuzzi, C. Rinaldi, M. Cantoni, R. Bertacco, and D. Petti, *Temperature Dependence of the Magnetic Properties of IrMn/CoFeB/Ru/CoFeB Exchange Biased Synthetic Antiferromagnets*, Materials (Basel). **13**, (2020).
- [14] E. Albisetti, S. Tacchi, R. Silvani, G. Scaramuzzi, S. Finizio, S. Wintz, C. Rinaldi, M. Cantoni, J. Raabe, G. Carlotti, R. Bertacco, E. Riedo, and D. Petti, *Optically Inspired Nanomagnonics with Nonreciprocal Spin Waves in Synthetic Antiferromagnets*, Adv. Mater. **32**, (2020).
- [15] C. Rinaldi, M. Asa, D. Chrastina, J. L. Hart, M. L. Taheri, I. Pallecchi, D. Marré, and M. Cantoni, *Study and Optimization of Epitaxial Films of Cr and Pt/Cr Bilayers on MgO*, J. Phys. D. Appl. Phys. **53**, (2020).
- [16] M. Asa, C. Autieri, R. Pazzocco, C. Rinaldi, W. Brzezicki, A. Stroppa, M. Cuoco, G. Varvaro, S. Picozzi, and M. Cantoni, *Anomalous Hall Effect in Antiferromagnetic/Nonmagnetic Interfaces*, Phys. Rev. Res. **2**, (2020).
- [17] J. Sławińska, D. Di Sante, S. Varotto, C. Rinaldi, R. Bertacco, and S. Picozzi, *Fe/GeTe(111) Heterostructures as an Avenue towards Spintronics Based on Ferroelectric Rashba Semiconductors*, Phys. Rev. B **99**, 75306 (2019).
- [18] G. Panzeri, A. Accogli, E. Gibertini, S. Varotto, C. Rinaldi, L. Nobili, and L. Magagnin, *Electrodeposition of Cobalt Thin Films and Nanowires from Ethylene Glycol-Based Solution*, Electrochem. Commun. **103**, 31 (2019).
- [19] G. Vinai, F. Motti, V. Bonanni, A. Y. Petrov, S. Benedetti, C. Rinaldi, M. Stella, D. Cassese, S. Prato, M. Cantoni, G. Rossi, G. Panaccione, and P. Torelli, *Reversible Modification of Ferromagnetism through Electrically Controlled Morphology*, Adv. Electron. Mater. **5**, (2019).

- [20] S. Varotto, L. Nessi, S. Cecchi, R. Calarco, R. Bertacco, and C. Rinaldi, *Investigation of Charge-to-Spin Conversion in GeTe*, in *Proceedings of SPIE - The International Society for Optical Engineering*, Vol. 10732 (2018).
- [21] M. Veis, J. Minár, G. Steciuk, L. Palačínus, C. Rinaldi, M. Cantoni, D. Kriegner, K. K. Tikuišis, J. Hamrle, M. Zahradník, R. Antoš, J. Železný, L. Šmejkal, X. Marti, P. Wadley, R. P. Campion, C. Frontera, K. Uhlířová, T. Duchoň, P. Kužel, V. Novák, T. Jungwirth, and K. Výborný, *Band Structure of CuMnAs Probed by Optical and Photoemission Spectroscopy*, *Phys. Rev. B* **97**, (2018).
- [22] G. Panzeri, L. Pedrazzetti, C. Rinaldi, L. Nobili, and L. Magagnin, *Electrodeposition of Nanostructured Cobalt Films from Choline Chloride-Ethylene Glycol Deep Eutectic Solvent*, *J. Electrochem. Soc.* **165**, D580 (2018).
- [23] G. Panzeri, A. Accogli, E. Gibertini, C. Rinaldi, L. Nobili, and L. Magagnin, *Electrodeposition of High-Purity Nanostructured Iron Films from Fe(II) and Fe(III) Non-Aqueous Solutions Based on Ethylene Glycol*, *Electrochim. Acta* **271**, 576 (2018).
- [24] M. Asa, G. Vinai, J. L. Hart, C. Autieri, C. Rinaldi, P. Torelli, G. Panaccione, M. L. Taheri, S. Picozzi, and M. Cantoni, *Interdiffusion-Driven Synthesis of Tetragonal Chromium (III) Oxide on BaTiO<sub>3</sub>*, *Phys. Rev. Mater.* **2**, (2018).
- [25] I. Maqueira-Albo, S. Varotto, M. Asa, C. Rinaldi, M. Cantoni, R. Bertacco, and F. Morichetti, *Integration of Non-Volatile Ferroelectric Actuators in Silicon Photonics Circuits*, in *International Conference on Transparent Optical Networks*, Vols. 2018-July (2018).
- [26] C. Rinaldi, L. Baldrati, M. Di Loreto, M. Asa, R. Bertacco, and M. Cantoni, *Blocking Temperature Engineering in Exchange-Biased CoFeB/IrMn Bilayer*, *IEEE Trans. Magn.* **54**, 1 (2018).
- [27] I. M. Albo, S. Varotto, M. Asa, C. Rinaldi, M. Cantoni, R. Bertacco, and F. Morichetti, *Non-Volatile Switching of Polycrystalline Barium Titanate Films Integrated in Silicon Photonic Waveguides*, in *Optics InfoBase Conference Papers*, Vol. Part F101- (Dipartimento Di Elettronica, Informazione e Bioingegneria Politecnico Di Milano, Milano, 20133, Italy, 2018).
- [28] M. Giacometti, C. Rinaldi, M. Monticelli, L. Callegari, A. Collovini, D. Petti, G. Ferrari, and R. Bertacco, *Electrical and Magnetic Properties of Hemozoin Nanocrystals*, *Appl. Phys. Lett.* **113**, 203703 (2018).
- [29] C. Rinaldi, S. Varotto, M. Asa, J. Sławińska, J. Fujii, G. Vinai, S. Cecchi, D. Di Sante, R. Calarco, I. Vobornik, G. Panaccione, S. Picozzi, and R. Bertacco, *Ferroelectric Control of the Spin Texture in GeTe*, *Nano Lett.* **18**, 2751 (2018).
- [30] G. Panzeri, M. Tresoldi, C. Rinaldi, and L. Magagnin, *Electrodeposition of Magnetic SmCo Films from Deep Eutectic Solvents and Choline Chloride-Ethylene Glycol Mixtures*, *J. Electrochem. Soc.* **164**, D930 (2017).
- [31] L. Baldrati, C. Rinaldi, A. Manuzzi, M. Asa, L. Aballe, M. Foerster, N. Biškup, M. Varela, M. Cantoni, and R. Bertacco, *Artificial Multiferroics: Electrical Switching of Magnetization in the Artificial Multiferroic CoFeB/BaTiO<sub>3</sub>* (*Adv. Electron. Mater.* 7/2016), *Adv. Electron. Mater.* **2**, (2016).
- [32] C. Rinaldi, S. Bertoli, M. Asa, L. Baldrati, C. Manzoni, M. Marangoni, G. Cerullo, M. Bianchi, R. Sordan, R. Bertacco, and M. Cantoni, *Determination of the Spin Diffusion Length in Germanium by Spin Optical Orientation and Electrical Spin Injection*, *J. Phys. D. Appl. Phys.* **49**, (2016).
- [33] M. Cantoni and C. Rinaldi, *Light Helicity Detection in MOS-Based Spin-Photodiodes: An Analytical Model*, *J. Appl. Phys.* **120**, (2016).
- [34] M. Liebmann, C. Rinaldi, D. Di Sante, J. Kellner, C. Pauly, R. N. Wang, J. E. Boschker, A. Giussani, S. Bertoli, M. Cantoni, L. Baldrati, M. Asa, I. Vobornik, G. Panaccione, D. Marchenko, J. Sánchez-Barriga, O. Rader, R. Calarco, S. Picozzi, R. Bertacco, and M. Morgenstern, *Giant Rashba-Type Spin Splitting in Ferroelectric GeTe(111)*, *Adv. Mater.* **28**, 560 (2016).
- [35] C. Rinaldi, J. C. Rojas-Sánchez, R. N. Wang, Y. Fu, S. Oyarzun, L. Vila, S. Bertoli, M. Asa, L. Baldrati, M. Cantoni, J.-M. George, R. Calarco, A. Fert, and R. Bertacco, *Evidence for Spin to Charge Conversion in GeTe(111)*, *APL Mater.* **4**, 32501 (2016).
- [36] L. Baldrati, C. Rinaldi, A. Manuzzi, M. Asa, L. Aballe, M. Foerster, N. Biškup, M. Varela, M. Cantoni, and R. Bertacco, *Electrical Switching of Magnetization in the Artificial Multiferroic CoFeB/BaTiO<sub>3</sub>*, *Adv. Electron. Mater.* **2**, 1600085 (2016).
- [37] M. Asa, L. Baldrati, C. Rinaldi, S. Bertoli, G. Radaelli, M. Cantoni, and R. Bertacco, *Electric Field Control of Magnetic Properties and Electron Transport in BaTiO<sub>3</sub>-Based Multiferroic Heterostructures*, *J. Phys. Condens. Matter* **27**, (2015).
- [38] R. Bertacco, G. Radaelli, D. Petti, E. Plekhanov, I. Fina, M. Asa, L. Baldrati, C. Rinaldi, M. Cantoni, P. Torelli, D. Gutiérrez, G. Panaccione, M. Varela, S. Picozzi, and J. Fontcuberta, *Switching Magnetic Order at an Fe/BaTiO<sub>3</sub> Interface on and off: Impact on Hybrid Magnetic-Ferroelectric Tunnel Junctions*, in (Institute of Electrical and Electronics Engineers Inc., Center LNESS, Politecnico Di Milano, Como, Italy, 2015).
- [39] M. Savoini, C. Piovera, C. Rinaldi, E. Albisetti, D. Petti, A. R. Khorsand, L. Duò, C. Dallera, M. Cantoni, R. Bertacco, M. Finazzi, E. Carpene, A. V. Kimel, A. Kirilyuk, and T. Rasing, *Bias-Controlled Ultrafast Demagnetization in Magnetic Tunnel Junctions*, *Phys. Rev. B* **89**, 140402 (2014).

- [40] C. Rinaldi, S. Bertoli, M. Cantoni, C. Manzoni, M. Marangoni, G. Cerullo, M. Bianchi, R. Sordan, and R. Bertacco, *Determination of Spin Diffusion Length in Germanium by Optical and Electrical Spin Injection*, in *SPIE 9167, Spintronics VII*, Vol. 9167 (2014), pp. 916709–916712.
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