

# Curriculum vitae Luis Manuel Álvarez-Prado

## Personal information

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## Work experience

**From 25/10/2011 to present** Senior Lecturer (permanent position) Oviedo University, Department of Physics.

**From 01/01/2010 to present** Member of the mixed unit Oviedo University/CSIC: CINN (Centro Mixto de Investigación en Nanomateriales y Nanotecnología).

**From 15/09/2017 to 20/12/2017** Invited Researcher, GEMacC Laboratoire (Versailles University-CNRS), Versailles, France. 3 months.

**From 01/04/2005 to 31/06/2005** Medium-term stage Grant from Oviedo University. Laboratoire Louis Néel-(CNRS), Grenoble, France. 3 months.

**From 01/04/2004 to 31/09/2004** Medium-term stage Grant from Oviedo University. Laboratoire Louis Néel-(CNRS), Grenoble, France. 4 months.

**From 01/07/2006 to 24/10/2011** Lecturer (ongoing contract) Oviedo University, Department of Physics. 64 months.

**From 14/11/2001 to 15/11/2001** Postdoctoral Grant, Invited Researcher, Laboratoire Louis Néel-(CNRS), Grenoble, France. 8 months.

**From 24/02/1997 to 30/06/2006** Assistant Professor (one-year contracts), Oviedo University, Department of Physics.

**From 01/01/1996 to 31/12/1996** Ph. D. Grant, Oviedo University.

**From 15/11/1994 to 15/11/1995** Researcher Grant, Laboratoire Louis Néel (CNRS), Grenoble, France.

**From 15/09/1993 to 14/11/1994** Ph. D. Grant, Oviedo University.

## Education and training

**20/08/2010** Habilitation in Condensed Matter Physics- Senior Lecturer.

**27/07/1999** Ph.D. in Physics, Oviedo University. Thesis title: "Magnetization processes in thin films and multilayers having competitive magnetic anisotropies ". Final mark: summa cum laude. Awarded with the Ph. D. Prix of the Oviedo University.

**19/09/1994** "Curso de doctorado" (Master Diploma) in Physics at the Univeristy of Oviedo, Final mark: sobresaliente, Thesis title: "The influence of anisotropy in stripe domains".

## Scientific participation in international and national research projects, selected for funding, based on calls that involved competitive peer review

1. **2020- to present** PID2019-104604-RB/AEI/10-13039/501100011033: Spanish Project "3D magnetic textures in multilayers and nanostructures for applications in energy harvesting and vortex racetracks"; 36 months, Research Assistant.

2. **2016-2019** FIS2016-760858-C4-1R: Spanish Project "Control de superconductividad y magnetismo mediante efectos de asimetría, anisotropía y proximidad"; 60 months, Research Assistant.

3. **2014-2016** FIS2013-45469-C4-4R: Spanish Project "Interacción y Manipulación de defectos topológicos: Nanoestructuras y multicapas Magnéticas"; 48 months, Research Assistant.

4. **2009-2014** FIS2008-06249-C02-02: "Fenómenos cooperativos en sistemas híbridos nanoestructurados: proximidad y acoplamiento en sistemas híbridos con nanoestructuras y multicapas magnéticas"; 60 months, Research Assistant.

5. **2008-2010** Regional Project FC-08-IB08-106: "Procesos de inversión de la Imanación en Sistemas Magnéticos Nanoestructurados con Interacciones de Canje"; 48 months, Research Assistant.

6. **2008-2013** MICINN-08-FIS2008-06249-C02: Spanish Project “Efectos cooperativos en sistemas híbridos con nanoestructuras y multicapas magnéticas”; 60 months, Research Assistant.
7. **2006-2008** NAN-2004-09807-C03-02: Spanish Project “Fabricación y caracterización de nanorectificadores superconductores y magnetismo basados en el efecto ratchet”; 24 months, Research Assistant.
8. **2005-2008** FIS2005-07392-C02-01: Spanish Project “Estudio experimental de sistemas mesoscópicos magnéticos: efectos de acoplamiento magnético en multicapas y superestructuras y efectos de proximidad en interacción con sistemas superconductores”; 48 months, Research Assistant.
9. **2002-2005** MAT-2002-04543-C02-01: Spanish Project “Fenómenos mesoscópicos en nanoestructuras magnéticas: efectos de tamaño en multicapas, líneas y puntos de materiales magnéticos blandos amorfos y policristalinos”; 48 months, Research Assistant.
10. **1998-2001** MAT99-0724: Spanish Project “Arreglos semiconductores, superconductores y materiales magnéticos hechos por litografía electrónica”; 48 months, Research Assistant.
11. **1994-1998** NANOMAG: European Project “Novel Magnetic-Sensitive High Resolution Techniques for Investigation of Nanomagnetic Properties and Ultrahigh Recording”; 48 months, Research Assistant.
12. **1992-1995** Spanish Project FMAT92/0787-C02-1: “Preparación y caracterización de láminas delgadas y multicapas basadas en Tierra Rara/Metal de transición”; 48 months, Research Assistant.

## Patents

**17 January 2014** “Soporte magnético para la grabación y lectura de información, método de almacenamiento y lectura de información y su uso”; Patent N. 201 100511, Spain.

## Main research interests

Magnetic properties of thin films, bilayers and multilayers formed by different coupled magnetic materials; Magnetic reversal in nanostructured materials; Perpendicular anisotropy in magnetic materials; Topological magnetic textures; Magneto-optical Kerr effect magnetometry (MOKE); Magnetic Force Microscopy (MFM); Near-Field Magneto-Optical Scanning Microscopy (MO-NFOM).

## Teaching Activity

**2015-present** Course of Modern Physics (Termodinamics) at the Faculty of Sciences.

**2017-present** Course of Foundations of Electromagnetism at the Faculty of Sciences.

**2019-present** Course of Advanced Magnetism (Master in Physics) at the Faculty of Sciences (Universidad de Oviedo).

**2005-present** Laboratory class of General Physics at the Faculty of Geology (Universidad de Oviedo), Role covered for 120 semesters.

**2008-17/12/2012** Codirector of the thesis untitled: “Confinement effects due to nanosputtering in magnetic thin films with perpendicular anisotropy”, defended by A. Hierro-Rodríguez), (Universidad de Oviedo). Final mark: summa cum laude.

**2015-2018** Course of Numerical methods for Physics at the Faculty of Sciences. Role covered for 48 semesters.

**01/06/2011-31/07/2011** Codirector of the stage to the introduction to research for young student (CSIC granted JAE-intro) of Sara Saa Rodríguez at the University of Oviedo. Thesis title: “Study of the nanopatterning effects in magnetic samples with magnetic perpendicular anisotropy”.

**2008-2011** Course of Computational Physics at the Faculty of Sciences. Role covered for 36 semesters.

**2010-2016** Course of Foundations of Optical and Conduction properties of Materials (Master in Materials) at the School of Mines (Universidad de Oviedo). Role covered for 36 semesters.

**15/07/2007** Codirector of the “Curso de doctorado” (Master Diploma) Master Thesis of Diego Martínez Gutiérrez in Physics at the University of Oviedo. Thesis title: “Micromagnetic simulation of amorphous thin film alloys with uniaxial magnetic anisotropy induced by concentration inhomogeneities”.

**2005-2019** Course of General Physics at the Faculty of Geology (Oviedo University), Role covered for 5 semesters.

**2005-2011** Laboratory class of State Solid State (Optics of metals), Role covered for 4 semesters.

**01/12/1999-31/07/2012** Course of Electronics (Optics of metals), Role covered for 4 semesters.

**24/02/1997-31/07/2001** Laboratory class of Electronics at the Faculty of Sciences (Universidad de Oviedo), Role covered for 3 semesters.

## Reviewer for Grants and Funded Research

**2018** Participant in the evaluation process of the ANEP (National Agency of Evaluation Processes), “Convocatoria Excelencia 2017”.

**2018** Participant in the evaluation process of the ANEP (National Agency of Evaluation Processes), “PROYECTO DE INVESTIGACIÓN CIENTÍFICA Y TRANSFERENCIA DE TECNOLOGÍA”.

**2017** Participant in the evaluation process of the ANEP (National Agency of Evaluation Processes), “Proyectos EXCELENCIA y Proyectos RETOS AGENCIA ESTATAL DE INVESTIGACIÓN”.

**2016** Participant in the evaluation process of the ANEP (National Agency of Evaluation Processes). “Programa Estatal de Fomento de la Investigación Científica y Técnica de Excelencia”.

**2013** Participant in the evaluation process of the ANEP (National Agency of Evaluation Processes). “Programa Estatal de Fomento de la Investigación Científica y Técnica de Excelencia”.

**2009** Participant in the evaluation process of the ANEP (National Agency of Evaluation Processes). “Infraestructuras y equipamientos”.

**2008** Participant in the evaluation process of the ANEP (National Agency of Evaluation Processes). “Programa de Investigación de la Universidad Complutense de Madrid”.

### Oral contributions to international conferences

**2020** “Reconfigurable magnetic properties induced by weak stripe domains”, Joint meeting of the Condensed Matter Divisions of the Spanish Royal Physics Society and the European Physical Society International conference on magnetism thin films and surfaces (CMC2020GEFES), Madrid.

**2019** “Magnetic singularities in 3D by X-ray magnetic tomography” 64<sup>th</sup> annual Conference on Magnetism and Magnetic Materials (MMM), Las Vegas.

**2018** “Method for 3D reconstruction of magnetization from Soft X-ray transmission tomography”, International Conference on Magnetism (ICM2018), San Francisco.

**2018** “Complex Magnetic Bubbles in Patterned of NdCo5 Films with Weak Perpendicular Magnetic Anisotropy.”, Joint European Magnetic Symposia (JEMS2018), Metz.

**2013** “Tailoring magnetization reversal processes in perpendicular magnetic anisotropy thin films with lateral magnetic multilayers”, Donostia International Conference on Nanoscaled Magnetism and Applications (DICMA2013), San Sebastián.

**2012** “Topological defects and misfit strain in magnetic stripe domains of lateral multilayers with perpendicular anisotropy fabricated by e-beam lithography” 5<sup>th</sup> workshop on Nanolithography 2012, San Sebastián.

**2006** “Near-Field magneto-optical scanning microscopy”, Workshop on the coupling of Synchrotron Radiation, IR and X-Ray with tip based Scanning probes Microscopes” (X-TIP), Grenoble.

**2006** “Magneto-optical Near-Field Scanning Microscopy”, Congress Fuerzas y tunel (FyT-06), Murcia.

**2005** “Near-Field magneto-optical microscopy”, Moskow International symposia in magnetism (MIMS0), Moskow.

**2004** “Efectos de la litografía controlada del espesor en de láminas delgadas magnéticas”, Congreso hispano-luso de métodos computacionales en ingeniería (CMCE04), Lisboa.

**2003** “Competing anisotropies in exchange coupled YCo<sub>2</sub> bilayers with growth-induced perpendicular uniaxial axes: a thickness dependence study”, International conference on magnetism thin films and surfaces (CMFS03), Madrid.

### Invited seminars

- “Magnetic thin films and nanostructures at the Condensed Matter group of the University of Oviedo”, Groupe D’étude de la matière condensée (GEMaC) of the Université de Versailles Saint-Quentin-en-Yvelines/CNRS, Versailles, France, 23 Nov 2017.

- “Numerical simulations in magnetism”, Instituto de Física da Universidade de São Paulo (IFUSP), São Paulo, Brasil, 13 July 2009.

- “Micromagnetism of multilayers with modulated and random in-plane anisotropy”, Laboratoire Louis Néel (CNRS), Grenoble, France, 15 June 2004.

- “Competitive anisotropies in magnetic thin films and multilayers”. ESRF, Grenoble, France, 28 April 1999.

### Publications

**51 peer-reviewed articles**, including 2 Nature Communications, 2 Phys. Rev. Lett., 1 Scientific Reports and 3 Appl. Phys. Lett., 530 total citations in Web of Science (on 09.06.2021), **h-index = 12**.

### List of publications in international journals with referees

1. L. M. Álvarez-Prado, “Control of dynamics in weak PMA magnets”, *Magnetochemistry*. **7**, 43 (2021).

2. P. Aguilar-Merino, G. Álvarez-Pérez, J. Taboada-Gutiérrez, J. Duan, I. Prieto, L. M. Álvarez-Prado, A. Y. Nikitin, J. Martín-Sánchez, P. Alonso-González, “Extracting the Infrared Permittivity of SiO<sub>2</sub> Substrates Locally by Near-Field Imaging of Phonon Polaritons in a van der Waals Crystal”. *Nanomaterials*. **11**, 120 (2021).

3. A. Hierro-Rodríguez, C. Quirós, A. Sorrentino, L. M. Álvarez-Prado, J. I. Martín, J. M. Alameda, S. McVitie, E. Pereiro, M. Vélez, S. Ferrer, M. Valvidares, “Revealing 3D magnetization of thin films with soft X-ray tomography: magnetic singularities and topological charges”. *Nature Comm.* **11**, 6382 (2020).

4. J. Díaz, P. Giagiani, C. Quirós, C. Redondo, R. Morales, L. M. Álvarez-Prado, J. I. Martín, A. Scholl, S. Ferrer, M. Vélez, S. M. Valvidares, "Chiral asymmetry in a 2D array of permalloy square nanomagnets using circularly polarized x-ray resonant magnetic scattering", *Nanotechnology*. **31**, 025702 (2020).
5. D. Markó, F. Valdés-Bango, C. Quirós, A. Hierro-Rodríguez, M. Vélez, J. I. Martín, J. M. Alameda, D. Schmool and L. M. Álvarez-Prado, "Tunable ferromagnetic resonance in coupled trilayers with crossed in-plane and perpendicular magnetic anisotropies", *Appl. Phys. Lett.* **115**, 082401 (2019). Selected as "Editor's Pick".
6. F. Valdés-Bango, M. Vélez, L. M. Álvarez-Prado, J. I. Martín, "Topological defects in weak perpendicular anisotropy NdCo honeycomb lattices", *New J. Phys.* **20**, 113007 (2018).
7. V. Rollano, J del Valle, A. Gómez, M. Vélez, L. M. Álvarez-Prado, C. Quirós, J. I. Martín, M. R. Osorio, D. Granados, E. M. Gonzalez, J. L. Vicent, "Magnetic order and disorder in nanomagnets probed by superconducting vortices", *Scientific Reports* **8**, 12374 (2018).
8. C. Quirós, A. Hierro-Rodríguez, A. Sorrentino, R. Valcárcel, L. M. Álvarez-Prado, J. I. Martín, J. M. Alameda, E. Pereiro, M. Vélez, S. Ferrer, "Cycloidal domains in the magnetization reversal of  $\text{Ni}_{80}\text{Fe}_{20}/\text{NdCo}_5/\text{Gd}_{12}\text{Co}_{88}$  trilayers", *Phys. Rev. Appl.* **10**, 014008 (2018).
9. A. Hierro-Rodríguez, D. Gürsoy, C. Phatak, C. Quirós, A. Sorrentino, L. M. Álvarez-Prado, M. Vélez, J. I. Martín, J. M. Alameda, E. Pereiro and S. Ferrer "3D reconstruction of magnetization from dichroic soft X-ray transmission tomography", *J. Synchrotron. Radiat.* **25**, 1144 (2018).
10. L. M. Álvarez-Prado, R. Cid, R. Morales, J. Díaz, M. Vélez, H. Rubio, A. Hierro-Rodríguez, J. M. Alameda, "Determination of the out-of-plane anisotropy contributions (first and second anisotropy terms) in amorphous Nd-Co thin films by micromagnetic numerical simulations", *J. Mag. Mat.* **456**, 251 (2018).
11. J. Herrero-Albillos, C. Castán-Guerrero, F. Valdés-Bango, J. Bartolomé, F. Bartolomé, F. Kronast, A. Hierro-Rodríguez, L. M. Álvarez-Prado, J. I. Martín, M. Vélez, J. M. Alameda, J. Sesé, L. M. García "2D magnetic domain wall ratchet: the limit of submicrometric holes", *Materials & Design* **138**, 111 (2018)
12. A. Hierro-Rodríguez, C. Quirós, A. Sorrentino, R. Valárcel, I. Estévez, L. M. Álvarez-Prado, J. I. Martín, J. M. Alameda, E. Pereiro, M. Vélez, S. Ferrer, "Deterministic propagation of vortex-antivortex pairs in magnetic trilayers", *Appl. Phys. Lett.* **110**, 242402 (2017).
13. A. Hierro-Rodríguez, C. Quirós, A. Sorrentino, C. Blanco-Roldán, L. M. Álvarez-Prado, J. I. Martín, J. M. Alameda, E. Pereiro, M. Vélez, S. Ferrer, "Observation of asymmetric distributions of magnetic singularities across magnetic multilayers", *Phys. Rev. B* **95**, 014430 (2017).
14. F. Valdés-Bango, M. Vélez, J. I. Martín, L. M. Álvarez-Prado and J. M. Alameda, "Magnetic stripes and holes: Complex domain patterns in perforated films with weak perpendicular anisotropy", *AIP Advances* **7**, 056303 (2017).
15. C. Blanco-Roldán, C. Quirós, A. Sorrentino, A. Hierro-Rodríguez, L. M. Álvarez-Prado, M. Duch, J. Esteve, J. I. Martín, M. Vélez, J. M. Alameda, E. Pereiro, S. Ferrer, "Nanoscale imaging of buried topological defects with quantitative X-ray magnetic microscopy", *Nature Comm.* **6**, 8196 (2015).



16. A. Hierro-Rodríguez, J. M. Teixeira, G. Rodríguez- Rodríguez, H. Rubio, M. Vélez, L. M. Alvarez-Prado, J. I. Martín, J. M. Alameda, "Unravelling the tunable exchange bias-like effect in magnetostatically-coupled two dimensional hybrid (hard/soft) composites", *Nanotechnology* **26**, 225302 (2015).
17. L. Ruiz-Valdepeñas, M. Vélez, F. Valdés- Bango, L. M. Álvarez-Prado, F. J. Garcia-Alonso, J. I. Martín, E. Navarro, J. M. Alameda, J. L. Vicent, "Imprinted labyrinths and percolation in Nd-Co/Nb magnetic/superconducting hybrids", *J. Appl. Phys.* **115**, 213901 (2014).
18. A. Hierro-Rodríguez, J. M. Teixiera, M. Vélez, L. M. Álvarez-Prado, J. I. Martín, J. M. Alameda, "Tunable exchange bias-like effect in patterned hard-soft two-dimensional lateral composites with perpendicular magnetic anisotropy", *Appl. Phys. Lett.* **105**, 102442 (2014).
19. A. Hierro-Rodríguez, M. Vélez, R. Morales, N. Soriano, G. Rodríguez-Rodríguez, L. M. Alvarez-Prado, Y. Souche, A. Alija, M. Vélez, J. V. Anguita, J. I. Martín, J. M. Alameda, "Controlled nucleation of topological defects in the stripe domain patterns of Lateral multilayers with perpendicular magnetic anisotropy: competition between magnetostatic, exchange and misfit interactions", *Phys. Rev. B* **88**, 174411 (2013).
20. L. Ruiz-Valdepeñas, M. Vélez, F. Valdés- Bango, L. M. Álvarez-Prado, J. I. Martín, E. Navarro, J. M. Alameda, J. L. Vicent, "Double percolation effect and fractal behaviour in magnetic/superconducting hybrids", *New J. Phys.* **15**, 103025 (2013).
21. A. Hierro-Rodríguez, G. Rodríguez- Rodríguez, J. M. Teixeira, G. N. Kazakei, J. B. Sousa, M. Vélez, J. I. Martín, L. M. Álvarez-Prado, J. M. Alameda, "Fabrication and magnetic properties of lateral multilayers with weak perpendicular anisotropy in Nd-Co amorphous films", *J. Phys. D*, **46**, 345001 (2013).
22. J. Díaz, R. Cid, A. Hierro-Rodríguez, L. M. Álvarez-Prado, C. Quirós, J. M. Alameda, "Large negative thermal expansion of the Co subnetwork measured by EXAFS in highly disordered Nd<sub>x</sub>Co<sub>1-x</sub> thin films with perpendicular magnetic anisotropy", *J. Phys. C*, **25**, 426002 (2013).
23. A. Hierro-Rodríguez, R. Cid, M. Vélez, J. I. Martín, L. M. Alvarez-Prado, J. M. Alameda, "Topological defects and misfit strain in magnetic striped domains of lateral multilayers with perpendicular anisotropy", *Phys. Rev. Lett.* **109**, 117202 (2012).
24. J. Díaz, C. Quirós, L. M. Alvarez-Prado, C. Aroca, R. Ranchal, M. Ruffoni, S. Pascarelli, "Determination of magnetostrictive atomic environments in FeCoB alloys", *Phys. Rev. B*, **85**, 134437 (2012).
25. A. Pérez-Junquera, V. I. Marconi, A. B. Kolton, L. M. Alvarez-Prado, Y. Souche, A. Alija, M. Vélez, J. V. Anguita J. M. Alameda, J. I. Martín, J. M. R. Parrondo, "Crossed-Ratchet Effects for Magnetic Domain Wall Motion Orthogonal Uniaxial Axes", *Phys. Rev. Lett.* **100**, 037203 (2008).
26. L. M. Álvarez-Prado, Y. Souche, R. Carminati, "Probing the transverse magneto-optical Kerr effect at the nanoscale", *Phys. Stat. Sol (a)* **204**, 1956 (2007).
27. A. Pérez-Junquera, J. I. Martín, J. V. Anguita, G. Rodríguez- Rodríguez, M. Vélez, H. Rubio, L. M. Álvarez-Prado, J. M. Alameda, "Depth dependence of Néel wall pinning on amorphous Co<sub>x</sub>Si<sub>1-x</sub> films with diluted arrays of elliptical dots", *J. Mag. Mag. Mat.* **316**, e27 (2007).



28. R. Cid, G. Rodríguez- Rodríguez, L. M. Álvarez-Prado, J. Díaz, J. M. Alameda, "Temperature dependence of the anisotropy of NdCo<sub>5</sub> thin films", J. Mag. Mag. Mat. **316**, e446 (2007).
29. J. Díaz, C. Quirós, L. Zárate, L. M. Álvarez-Prado, J. M. Alameda, "Atomic pair ordering and magnetic anisotropy of Fe-Si amorphous films studied by linearly polarized EXAFS", J. Mag. Mag. Mat. **316**, e390 (2007).
30. L. M. Álvarez-Prado, J. M. Alameda, "Magnetic characterization of exchange-coupled thin films having competing anisotropies", J. Mag. Mag. Mat. **316**, e872 (2007).
31. L. G. C. Melo, A.D. Santos, L. M. Álvarez-Prado, Y. Souche, "Optimization of the TMOKE response using the ATR configuration", J. Mag. Mag. Mat. **310**, e947 (2007).
32. L. M. Álvarez-Prado, J. Shoenmaker, A.D. Santos, T. Fournier, Y. Souche, "Magneto-optical scanning near-field microscope.", Phys. Stat. Sol (a) **203**, 1425 (2006).
33. M. Vélez, C. Meny, S. M. Valvidares, J. Díaz, R. Morales, L. M. Álvarez-Prado, P. Panissod, J. M. Alameda, "Amorphous to polycrystalline transition in Co<sub>x</sub>Si<sub>1-x</sub> alloy thin films"" Eur. J. Phys. B **41**, 517 (2004).
34. R. Morales, J. I. Martín, L. M. Álvarez-Prado, J. M. Alameda, "Compensation temperatures and composition homogeneity in amorphous Gd<sub>x</sub>Co<sub>1-x</sub> films", J. Mag. Mag. Mat. **272-245**, 1427 (2004).
35. L. M. Álvarez-Prado, J. M. Alameda, "Micromagnetism of nanowires with low out-of-plane anisotropy", Phys. B **343**, 241 (2004).
36. S. M. Valvidares, J. I. Martín, L. M. Álvarez-Prado, D. Pain, O. Acher, G. Suran, J. M. Alameda, "Inverted hysteresis loops in annealed Co-Fe-Mo-Si-B amorphous thin films", J. Mag. Mag. Mat. **242-245**, 169 (2002).
37. R. Collins, J.P. Levy, L. M. Álvarez-Prado, Y. Souche, "Photoelectrodeposition of patterned cobalt films on silicon substrates", J. Mag. Mag. Mat. **242-245**, 578 (2002).
38. S. M. Valvidares, L. M. Álvarez-Prado, J. I. Martín, J. M. Alameda, "Inverted hysteresis loops in magnetically coupled bilayers with uniaxial competing anisotropies: Theory and experiments.", Phys. Rev. B **64**, 134423 (2001).
39. C. Dehesa, L. Blanco-Gutiérrez, M. Vélez, J. Díaz, L. M. Álvarez-Prado, J. M. Alameda, "Magneto-optical transverse Kerr effect in multilayers", Phys. Rev. B **64**, 024417 (2001).
40. L. M. Álvarez-Prado, J. M. Alameda, "Weak stripe domains in amorphous thin films: the role of the  $\mu^*$ -effect", Phys. B **299**, 265 (2001).
41. R. Morales, L. M. Álvarez-Prado, J. M. Alameda, "Magnetic coupling in amorphous bilayers and sandwiches (RCo)/(A)/-(RCo)' (R: Y,Gd; A: Y,Mo).", J. All. Comp. **323**, 504 (2001).
42. Y. Souche, M. Schlenker, R. Raphel, L. M. Álvarez-Prado, "Near Field Optics and Magnetism", Mat. Res. Forum **302-303**, 105 (1999).

43. G. T. Pérez, F. H. Salas, R. Morales, L. M. Álvarez-Prado, J. M. Alameda, "Periodical magnetic effects in  $\text{Fe}_x\text{Si}_{1-x}/\text{Si}$  multilayers, related with modulation length", J. Mag. Mag. Mat. **196-197**, 20 (1999).
44. L. Blanco-Guriérrez, C. Dehesa, L. M. Álvarez-Prado, J. Díaz, J. M. Alameda, "Transverse Kerr effect as an analytical tool in the study of the magnetism of transition metal-Yttrium alloys", J. Mag. Mag. Mat. **196-197**, 597 (1999).
45. L. M. Álvarez-Prado, F. H. Salas, J. M. Alameda, "Inverted hysteresis loop in magnetic multilayers showing macroscopic ferrimagnetic behaviour", J. Mag. Mag. Mat. **196-197**, 796 (1999).
46. F. Salas, J. M. Alameda, L. M. Álvarez-Prado, R. Morales, G. T. Pérez, "Thermal evolution of magnetic properties of thin films having perpendicular anisotropy", J. de Physique IV **8**, 119 (1998).
47. G. T. Pérez, F. Salas, R. Morales, L. M. Álvarez-Prado, J. M. Alameda, "Short-Range order effects in amorphous magnetic  $\text{Fe}_x\text{Si}_{1-x}/\text{Si}$  multilayers induced by preparation conditions", J. de Physique IV **8**, 175 (1998).
48. R. Morales, L. M. Álvarez-Prado, F. Salas, G. T. Pérez, J. M. Alameda, "Coupling of  $\text{YCo}_2$  thin films in a macroscopic ferrimagnet", J. de Physique IV **8**, 277 (1998).
49. L. M. Álvarez-Prado, G. T. Pérez, R. Morales, F. Salas, J. M. Alameda, "Perpendicular anisotropy detected by TBIAS via MOKE in  $\text{Fe}_x\text{Si}_{1-x}$  thin films and amorphous  $\text{Fe}_x\text{Si}_{1-x}/\text{Si}$  multilayers: experiment and theory.", Phys. Rev. B **56**, 5663 (1996).
50. J. M. Alameda, F. Carmona, L. M. Álvarez-Prado, R. Morales, G. T. Pérez, F. H. Salas, "Effects of the initial stages of film growth on the magnetic anisotropy of obliquely deposited cobalt thin films", J. Mag. Mag. Mat. **154**, 249 (1995).
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