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Department of Physics
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Youtube: <https://www.youtube.com/numanakdogan>

EDUCATION

- 2004-2008 **Ph.D.** Inst. for Experimental Physics/Condensed Matter Physics
Ruhr-Universität Bochum, Bochum, Germany
Thesis: “*[Origin of ferromagnetism in oxide-based diluted magnetic semiconductors](#)*”
Advisor: Prof. Dr. Dr. h. c. Hartmut Zabel
- 2002-2004 **M.Sc.** Department of Physics (Grade: 3.38/4.00)
Yildiz Technical University, Istanbul, Turkey
Thesis: “*[Magneto-optical measurements of thin films](#)*”
- 1997-2001 **B.Sc.** Department of Physics (Grade: 3.26/4.00)
Yildiz Technical University, Istanbul, Turkey

WORK EXPERIENCE

- March-June 2004 **Visiting Scientist**, Ruhr-Universität Bochum
Inst. for Experimental Physics/Condensed Matter Physics
Bochum, Germany
- 2004-2008 **Research Assistant**, Ruhr-Universität Bochum
Inst. for Experimental Physics/Condensed Matter Physics
Bochum, Germany
- 2008-2010 **Post-doctoral Researcher**, Gebze Institute of Technology
Department of Physics
Kocaeli, Turkey
- 2010-2012 **Assistant Professor**, Gebze Institute of Technology
Department of Physics
Kocaeli, Turkey
- 2012-2014 **Associate Professor**, Gebze Institute of Technology
Department of Physics
Kocaeli, Turkey

2014-2018	Associate Professor , Gebze Technical University Department of Physics Kocaeli, Turkey
2018-	Professor , Gebze Technical University Department of Physics Kocaeli, Turkey
2022-	Founder , Mikronya Lithography Systems Ltd. GTÜ Teknopark, Kocaeli, Turkey www.mikronya.com

EXPERIMENTAL SKILLS

A-Experiments at large scale facilities

Several x-ray experiments at the synchrotron sources of *the “Hamburg Synchrotron Radiation Laboratory” (HASYLAB)*, *the “Dortmund Electron Accelerator” (DELTA)*, *the BESSY II synchrotron radiation facility in Berlin*.

Technical support for the external users of the Alice diffractometer at BESSY II in Berlin.

B-Experimental techniques for the growth/characterization of thin films and device fabrication

I) Thin film deposition

Magnetron sputtering

II) Structural characterization

X-ray diffraction (XRD)

X-ray absorption spectroscopy (XAS)

Atomic force microscopy (AFM)

Scanning electron microscopy (SEM)

III) Magnetic characterization

Magneto-optical Kerr effect (MOKE)

Physical Property Measurement System (PPMS) VSM magnetometry

Superconducting quantum interference device (SQUID) magnetometry

X-ray resonant magnetic scattering (XRMS)

X-ray magnetic circular dichroism (XMCD)

Ferromagnetic resonance (FMR)

IV) Electronic characterization

Four probe Hall effect measurements

Magneto-transport measurements (AMR, GMR, PHE)

V) Micro/Nano Device Fabrication

Laser and UV lithography

Microcontact printing

Microfluidic chips

Planar Hall sensors

Shapeable sensors

FELLOWSHIPS

- October 17, 2004 **Ph.D. Fellowship** (3 Years), Germany
International Max Planck Research School for Surface and Interface
Engineering in Advanced Materials-IMPRS “SurMat”
Düsseldorf, Germany
- March 2004 **Research Fellowship** (3 Months), Germany
SFB 491 Magnetic Heterostructures: Spinstructure and Spintransport
Bochum, Germany

LANGUAGE SKILLS

English: Fluent, ÜDS-March 2008: 80
German: Basic
Arabic: Basic

INTERNATIONAL MEMBERSHIPS

1. Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Berlin, Germany)
2. The Hamburger Synchrotronstrahlungslabor (HASYLAB) at Deutsches Elektronen-Synchrotron (DESY) (Hamburg, Germany)
3. Dortmunder ELekTronenspeicherring-Anlage (DELTA) (Dortmund, Germany)
4. DAAD-RISE (Research Internships in Science and Engineering) (Bonn, Germany)
5. International Max Planck Research School for Surface and Interface Engineering in Advanced Materials (IMPRS-SurMat) (Düsseldorf, Germany)

LECTURES

PHYS 615 Magnetic Materials (Graduate level)
PHYS 515 X Ray Technologies (Graduate level)

PHYS 439 Magnetic Materials (Undergraduate level)
PHYS 499 X Ray Technologies (Undergraduate level)
FİZ 305 Optik (Undergraduate level)

BOOK

N. Akdoğan and H. Zabel, Origin of Magnetism in Oxide-Based Diluted Magnetic Semiconductors (Original form of my PhD thesis), LAMBERT Academic Publishing (2014)

BOOK CHAPTER

N. Akdoğan and H. Zabel, Origin of Ferromagnetism in Co-implanted ZnO (Nanostructured Magnetic Materials and Their Applications, Eds. B. Aktaş, F. Mikailzade), **Springer (2013)**

INVITED LECTURES

4) Applications of Nanomagnetism and Spintronics, Spring School & Educational Courses (SSEC) on Superconductivity and Magnetism, 21-26 April 2014, Kervansaray Lara, Antalya, Turkey

3) Basics of Magnetism, Spring School & Educational Courses (SSEC) on Superconductivity and Magnetism, 21-26 April 2014, Kervansaray Lara, Antalya, Turkey

2) Applications of X-rays in characterizing new materials, International Henry Moseley X-Ray Science Summer School and Workshop June 14-23, 2012, Turunç, Marmaris, Turkey

1) Diluted Magnetic Semiconductors for Spintronic Device Applications, International Spring School & Educational Courses, 20-25 April 2010, Porto Bello Hotel, Antalya, Turkey

INVITED SEMINARS

Türkiye’de Çip Sanayisi Mümkün Mü? Kocaeli Kent Konseyi Yönetim Kurulu Toplantısı, 23.02.2022

Mikro/Nano Aygıtlardaki Son Gelişmeler ve Türkiye’nin Bu Yarıştaki Durumu, Kocaeli Kent Konseyi Gençlik Meclisi Kış Kampı, 19.12.2021

Mikro/Nano Aygıtlardaki Son Gelişmeler, Kabataş Erkek Lisesi, 02.02.2021

Mikro/Nano Aygıtlardaki Son Gelişmeler, Yücel Boru Fen Lisesi Kariyer Günleri, 19.02.2020

Nanoteknolojideki Son Gelişmeler, Bayrampaşa Üniversite Hazırlık Öğrencileri, 22.03.2019

Nanoteknolojideki Son Gelişmeler, Kocaeli Fen Lisesi, 30.11.2018

Nanoteknolojideki Son Gelişmeler, Boğaziçi Üniversitesi Öğrencileri, 02.11.2018

Nanobiyoteknoloji ve Biyosensörler, Düzce Üniversitesi, Biyomedikal Mühendisliği Günleri, 08.05.2018

Nanoteknoloji, Üsküdar Çocuk Üniversitesi, İstanbul, 24.04.2018

Nanoteknoloji ve Biyo Uygulamaları, Hisar Hospital Intercontinental, İstanbul, 18.04.2018

Nanoteknoloji ve İnovasyon, KYK AR-GE İnovasyon (Yapay Zeka) Kampı, Kocaeli, 15.01.2018

Kazan Federal University, Department of Physics, Tatarstan, 27.06.2012

Kocaeli University, Nanotechnology Days, 08.05.2011

Sabancı University, Department of Physics, 29.12.2010

Boğaziçi University, Department of Physics, 24.11.2010

Yıldız Technical University, Department of Physics, 27.10.2010

Afyon Kocatepe University, ADIM Physics Day, 21.05.2010

Bilkent University, Department of Physics, UNAM, 08.01.2010

Istanbul Technical University, Department of Physics, 25.04.2008

EDITORSHIP

Special Issue Guest Editor

Journal of Magnetism and Magnetic Materials

SI: Nanomagnetism and Spintronics

ADMINISTRATIVE DUTIES

GTÜ Nanoteknoloji Enstitüsü (GTÜNANO) Müdürü (2016-2018)

GTÜ Nanoteknoloji Araştırma ve Uygulama Merkezi (GTÜNAM) Müdürü (2017-2018)

GTÜ Senato Üyesi (2016-2018)

GTÜ Burslar Koordinatörü (2015-2018)

GTÜ Genç Butik Koordinatörü (2015-2016)

Kocaeli Ansiklopedisi Danışma Kurulu Üyesi (14.01.2021-)

Kocaeli Kent Konseyi Yürütme Kurulu Üyesi (24.12.2016-)

Kocaeli Yerel Kültür Paneli Düzenleme Kurulu Üyesi (16.04.2016)

Kocaeli Kentlilik Bilinci Çalıştayı Düzenleme Kurulu Üyesi (09.01.2016)

Geçmişten Geleceğe Dilovası İlçesi Paneli Bilim Kurulu Başkanı (11.06.2015)

Dilovası Köyleri Yardımlaşma ve Dayanışma Derneği Başk. Yrd. (30.11.2014-07.04.2021)

Bitlis İl Merkez Jandarma Komutanlığı Mehmetçik Dershanesi Müdürü (Ocak-Mayıs 2009)

Kültürlerarası Akademisyenler Birliği (BIKA-Bund Interkultureller Akademiker) Kurucu Başkanı (Gelsenkirchen, Almanya) (29.01.2005-24.06.2006)

SCIENTIFIC REPORTS

- 5) N. Akdogan, A. Nefedov, R. I. Khaibullin, L. R. Tagirov and H. Zabel, Observation of two ferromagnetic phases in Co-implanted ZnO, **BESSY ANNUAL REPORT** 2006, Berlin, Germany
- 4) N. Akdogan, A. Nefedov, R. I. Khaibullin, L. R. Tagirov and H. Zabel, Spin polarization of oxygen atoms in cobalt-doped ZnO, **BESSY ANNUAL REPORT** 2006, Berlin, Germany
- 3) N. Akdogan, A. Nefedov, H. W. Becker, R. I. Khaibullin, L. R. Tagirov and H. Zabel, Structural characterization of cobalt implanted TiO₂ rutile films, **HASYLAB ANNUAL REPORT** 2006, Hamburg, Germany
- 2) G. Nowak, A. Remhof, A. Nefedov, N. Akdogan, A. Liebing, B. Hjörvarsson¹, K. Westerholt and H. Zabel, Structure characterization of H-assisted grown Fe/V superlattices, **HASYLAB ANNUAL REPORT** 2005, Hamburg, Germany
- 1) A. Nefedov, N. Akdogan, R. I. Khaibullin, L. R. Tagirov and H. Zabel, Polarization of oxygen in Co-doped TiO₂, **BESSY ANNUAL REPORT** 2005, Berlin, Germany

RESEARCH PROJECTS

BESSY Project (27.11-04.12.2006), Germany

Project Number: 2006_2_60415

A. Nefedov, H. Zabel, N. Akdogan, A. Remhof

Project Title: Time resolved XRMS studies from patterned magnetic films.

BESSY Project (04.12-11.12.2006), Germany

Project Number: 2006_2_60384

A. Nefedov, H. Zabel, N. Akdogan

Project Title: Coexistence of ferromagnetism and antiferromagnetism in Fe-doped TiO₂: XMCD and XRMS studies.

BESSY Project (12.03-18.03.2007), Germany

Project Number: 2007_1_60789

A. Nefedov, H. Zabel, N. Akdogan, S. Buschhorn, E. Kravtsov

Project Title: Application of soft x-ray resonant scattering to study charge-density waves in Cr/V multilayers.

TÜBİTAK - RFBR Joint Project (2010-2012), Turkey-Russia

Project Number: 209T061

B. Aktaş, F. Mikailzade, B. Rameev, N. Akdoğan

Project Title: Development of layered and composite magnetic nanostructured materials for spintronic applications.

TÜBİTAK 1001 Project (2011-2014), Turkey

S. Güner, B. Ünal, S. Çalışkan, N. Akdoğan

Project Title: Theoretical and Experimental Investigations of Spin Injection and Rashba Effect in Ferromagnetic Metal Implanted ZnO Heterostructures

TÜBİTAK 1001 Project (2013-2016), Turkey

N. Akdoğan, S. Kazan, F. Yıldız

Project Title: Electrical field manipulation of exchange bias in perpendicularly magnetized Pt/Co/CoO and Pt/Co/IrMn thin films

TÜBİTAK 1001 Project (2017-2020), Turkey

N. Akdoğan, L. Ç. Arslan

Project Title: Exchange Bias Tabanlı Planar Hall Etkisi (PHE) Sensörlerinin Üretilmesi Ve Karakterizasyonu

Gebze Teknik Üniversitesi BAP (2016)

N. Akdoğan

Project Title: Planar Hall etkisi sensörlerinde hassasiyetin antiferromanyetik tabakanın kalınlığına bağlı olarak incelenmesi

Gebze Teknik Üniversitesi BAP (2014)

N. Akdoğan

Project Title: Pt/Co/IrMn ince filmlerin yapısal ve manyetik özelliklerinin incelenmesi

ALUMNI

- 11) Dr. Hasan Pişkin (PostDoc, Boğaziçi University, Turkey)
- 10) Dr. Bayram Kocaman (Siirt University, Turkey)
- 9) Burak Özer (PhD Student, IFW Dresden, Germany)
- 8) Dr. Selahattin Çelik (Teacher, High School, İstanbul, Turkey)
- 7) Dr. Ekrem Sınır (TÜBİTAK UME, Turkey)
- 6) Ayşe Sönmez (PhD Student, Department of Physics, Gebze Technical University, Turkey)
- 5) Ayşe Canlı (Teacher, Private High School, İstanbul, Turkey)
- 4) Dr. Ahmet Yağmur (Tohoku University, Japan)
- 3) Utku Ulucan (PhD Student, Materials Science and Engineering, İzmir Institute of Technology, Turkey)
- 2) Dr. Erdem Demirci (Department of Physics, Gebze Technical University, Turkey)
- 1) Dr. Mustafa Öztürk (Department of Physics, Gebze Technical University, Turkey)

PhD THESES (ONGOING)

- 1) Ömer Nazır, Planar Hall effect-based tactile sensing arrays for humanoid robotics.

MSc Theses (Ongoing)

- 1) Davut Yıldırım, Fabrication of a microfluidic device for lung-on-a-chip applications.
- 2) Kübra Gökmen, Optimization of a microfluidic chip design for nerve cells and their microenvironment studies (Boğaziçi Üniversitesi Biyomedikal Mühendisliği'nden Doç. Dr. Özgür Kocatürk ile birlikte.)

PhD THESES (COMPLETED)

- 6) Dr. Hasan Pişkin (24.02.2020), NiFe/X/IrMn (X: Cu, Cr, Pt)-Tabanlı Planar Hall Etkisi Sensörlerinin Üretilmesi ve Karakterizasyonu.
- 5) Dr. Bayram Kocaman (22.11.2018), Reduction of shunt current in IrMn based spin-valve

structures.

4) Dr. Selahattin Çelik (08.11.2017), Investigation of exchange bias effect in perpendicularly magnetized ferromagnetic thin films.

3) Dr. Ekrem Sınır (21.09.2017), Structural and magnetic properties of exchanged biased Co/CoO multilayers.

2) Dr. Erdem Demirci (27.07.2016), Investigation of exchange bias in Cr₂O₃ based magnetoelectric materials.

1) Dr. Mustafa Öztürk (27.07.2016), Electrical field control of exchange bias in Co/CoO based thin films.

MSc THESES (COMPLETED)

7) Burak Özer (26.10.2018), Planar Hall etkisine dayalı biyosensörlerin şekillendirilebilir yüzeylere büyütülmesi.

6) Ayşe Canlı (22.07.2015), PtCo/CoO İnce Filmlerin Manyetik özelliklerinin PtCo Kalınlığına Bağlı Olarak İncelenmesi.

5) Ayşe Sönmez (22.07.2015), [Ni/CoO]_x Çok Katlı İnce Filmlerin Yapısal ve Manyetik Özelliklerinin İncelenmesi.

4) Ahmet Yağmur (01.07.2013), Çok katlı ince filmlerde (Pt/Co/Pt/CoO) kaydırma (exchange bias) etkisi.

3) Utku Ulucan (03.07.2012), PtCo/CoO ince filmlerde kaydırma (exchange bias) etkisi.

2) Erdem Demirci (26.01.2011), CoO/Co manyetik ince filmlerde kaydırma (exchange bias) etkisi.

1) Mustafa Öztürk (17.01.2011), Manyetik malzemelerde (Fe/CoO) kaydırma (exchange bias) etkisi, Yrd. Doç. Dr. İlker Cenik ile birlikte.

NEWS AND TV PROGRAMS

NANOTEKNOLOJİ, YAPAY ZEKA VE TÜRKİYE'NİN GELECEĞİ BÖLÜM 1, Vizyon Programı (Canlı Yayın): [NANOTEKNOLOJİ VE YAPAY ZEKA BÖLÜM 1. 12.01.2018 \(Süre: 01.08.16\)](#)

NANOTEKNOLOJİ, YAPAY ZEKA VE TÜRKİYE'NİN GELECEĞİ BÖLÜM 2, Vizyon Programı (Canlı Yayın): [NANOTEKNOLOJİ VE YAPAY ZEKA BÖLÜM 2. 12.01.2018 \(Süre: 00.15.24\)](#)

TÜRKİYE'DE EĞİTİM, BİLİM VE TEKNOLOJİNİN TARİHİ VE GELECEĞİ, Vizyon Programı (Canlı Yayın): [TÜRKİYE'DE EĞİTİM, BİLİM VE TEKNOLOJİ.16.02.2018 \(Süre: 01.29.33\)](#)

NANOTEKNOLOJİ, Kentin Dünü Bugünü Programı (Canlı Yayın): [NANOTEKNOLOJİ.17.05.2017 \(Süre:00:55:22\)](#)

MANYETİK BİYOSENSÖRLER, Anadolu Ajansı (AA) Haberi: [Yerli biyosensörle sıvı analizi 1 dakikada yapılacak. 12.10.2016 \(Süre:00:02:03\)](#)

NEWSPAPER ARTICLES

2) Şafak Gök, Erdem Demirci, Mustafa Öztürk ve Numan Akdoğan, [Gebze Teknik Üniversitesi Mikro/Nano Aygıt Üretim Laboratuvarı, CleanroomNews - Temizoda Teknolojileri Gazetesi, 29 Kasım 2017](#)

1) Hasan Pişkin, Bayram Kocaman, Züriye Çapku, Burak Özer ve Numan Akdoğan, [Biyosensörler, CleanroomNews - Temizoda Teknolojileri Gazetesi, 28 Eylül 2017](#)

PATENTS

3) Numan Akdoğan, Mustafa Öztürk, "Multifunctional Sample Rod and Connection Station for Transport Measurements" TR Patent 2015 09253 B (21 June 2019).

2) Erdem Demirci, Numan Akdoğan, "Multifunctional Sample Holder and High Resolution Detection System for Magneto-optical Kerr Effect Measurements" TR Patent 2015 09249 B (21 June 2019)

1) Numan Akdoğan, Mustafa Öztürk, Erdem Demirci, "Liquid nitrogen and liquid helium flow measurement chamber with optical window" TR Patent 2015 17168 B (21 November 2018).

PUBLICATIONS

- 37) Amir Elzwawy, Hasan Pişkin, Numan Akdoğan, Marius Volmer, Guenter Reiss, Luca Marnitz, Anastasiia Moskaltsova, Ogan Gurel and Jan-Michael Schmalhorst, Current trends in planar Hall effect sensors: evolution, optimization, and applications, **J. Phys. D: Appl. Phys.** **54**, 353002 (2021) [DOI]
- 36) H. Pişkin, E. Demirci, M. Öztürk, and N. Akdoğan, Experimental determination of the orientation of tilted magnetic anisotropy by using angle-resolved Hall effect signals, **J. Supercond. Nov. Magn.** **34**, 1435–1440 (2021) [DOI]
- 35) H. Pişkin and N. Akdoğan, Tuning the magnetic field sensitivity of planar Hall effect sensors by using a Cr spacer layer in a NiFe/Cr/IrMn trilayer structure, **Turkish Journal of Physics** **44**, 554-563 (2020) [DOI]
- 34) E. Demirci, M. Öztürk, H. Pişkin, and N. Akdoğan, Angle-dependent inverted hysteresis loops in an exchange biased [Co/Pt]5/IrMn thin film, **Journal of Superconductivity and Novel Magnetism**, **33**, 721-726 (2020) [DOI]
- 33) H. Pişkin and N. Akdoğan, Interface-induced enhancement of sensitivity in NiFe/Pt/IrMn-based planar Hall sensors with nanoTesla resolution, **Sensors and Actuators A: Physical** **292**, 24-29 (2019) [DOI]
- 32) B. Özer, H. Pişkin, and N. Akdoğan, Shapeable planar Hall sensor with a stable sensitivity under concave and convex bending, *IEEE Sensors Journal* **19**, 5493 (2019) [DOI]
- 31) B. Kocaman and N. Akdoğan, Reduction of shunt current in buffer-free IrMn based spin-valve structures, **J. Magn. Magn. Mater.** **456**, 17–21 (2018) [DOI]
- 30) M. Öztürk and N. Akdoğan, Design of a multifunctional sample probe for transport measurements, **Turkish Journal of Physics** **42**, 97-103 (2018) [DOI]
- 29) Kalengay Mbela, T. Moyo, Nadir S. E. Osman, N. Akdoğan, M. Öztürk, Magnetic studies of $Mn_{0.2}Cr_{1.8-x}Fe_xO_3$ nano oxides prepared via hydrothermal route, **Journal of Materials Science: Materials in Electronics** **27**, 9172–9178 (2016) [DOI]
- 28) M. Öztürk, E. Demirci, M. Erkovan, O. Öztürk and N. Akdoğan, Coexistence of perpendicular and in-plane exchange bias using a single ferromagnetic layer in Pt/Co/Cr/CoO thin film, **Europhysics Letters**, **114**, 17008 (2016) [DOI]
- 27) M. Erkovan, M. E. Aköz, M. Öztürk, E. Demirci, U. Parlak, N. Akdoğan, O. Öztürk, Probing exchange bias properties of $Pt_x Co_{1-x}/Pt/CoO$ films, **J. Supercond. Nov. Magn.** **29**, 163 (2016) [DOI]
- 26) E. Demirci, M. Öztürk, M. T. Öcal, O. Öztürk, N. Akdoğan, Investigation of spin canting phenomena in perpendicularly exchange biased Pt/Co/Pt/Cr₂O₃ thin films, **Thin Solid Films** **591**, 72 (2015) [DOI]
- 25) N. Akdoğan, A. Yağmur, M. Öztürk, E. Demirci, O. Öztürk, M. Erkovan, Interface induced manipulation of perpendicular exchange bias in Pt/Co/(Pt, Cr)/CoO thin films, **J. Magn. Magn. Mater.** **373**, 120 (2015) [DOI]

- 24) M. Öztürk, E. Demirci, O. Gürbüz, S. Güner, V. Valeev, F. Vagizov, R. Khaibullin, N. Akdoğan, Formation of different magnetic phases and high Curie temperature ferromagnetism in Fe⁵⁷-implanted ZnO film, **J. Magn. Magn. Mater.** **373**, **83** (2015) [\[DOI\]](#)
- 23) B. Aktaş, F. Mikailzade, B. Rameev, N. Akdoğan, Recent advances in nanomagnetism and spintronics, **J. Magn. Magn. Mater.** **373**, **1** (2015) [\[DOI\]](#)
- 22) G. Sadullahoğlu, B. Ertuğ, H. Gökçe, B. Altuncevahir, M. Öztürk, R. Topkaya, N. Akdoğan, M. L. Öveçoğlu and O. Addemir, The Effect of Milling Time and Sintering Temperature on Crystallization of BaFe₁₂O₁₉ Phase and Magnetic Properties of Ba-Hexaferrite Magnet, **Acta Physica Polonica Series a** **128(3):377** (2015) [\[DOI\]](#)
- 21) S. Güner, O. Gürbüz, S. Çalışkan, R. Khaibullin, V. I. Nuzhdin, M. Öztürk, N. Akdoğan, The structural and magnetic properties of Co⁺ implanted ZnO films, **Applied Surface Science** **310**, **235** (2014) [\[DOI\]](#)
- 20) R. Topkaya, S. Kazan, R. Yilgin, N. Akdoğan, M. Özdemir and B. Aktaş, Ferromagnetic resonance studies of exchange biased CoO/Fe film grown on MgO substrate, **J. Supercond. Nov. Magn.** **27**, **1503** (2014) [\[DOI\]](#)
- 19) Erdem Demirci, Mustafa Öztürk, Ekrem Sınır, Utku Ulucan, Numan Akdoğan, Osman Öztürk, Mustafa Erkovan, Temperature-dependent exchange bias properties of polycrystalline Pt_xCo_{1-x}/CoO bilayers, **Thin Solid Films** **550**, **595–601** (2014) [\[DOI\]](#)
- 18) K. Mbela, T. Moyo, J. Z. Msomi, M. Öztürk and N. Akdoğan, Synthesis and magnetic properties of Mg_{0.2}Cr_{1.8-x}Fe_xO₃ nanoparticles, **J. Magn. Magn. Mater.** **330**, **159** (2013) [\[DOI\]](#)
- 17) M. Öztürk, E. Sınır, E. Demirci, M. Erkovan, O. Öztürk and N. Akdoğan, Exchange bias properties of [Co/CoO]_n multilayers, **J. Appl. Phys.**, **112**, **093911** (2012) [\[DOI\]](#)
- 16) Sinan Dursun, Ramazan Topkaya, Numan Akdoğan and Sedat Alkoy, Comparison of the structural and magnetic properties of submicron barium hexaferrite powders prepared by molten salt and solid state calcination routes, **Ceramics International**, **38**, **3801** (2012) [\[DOI\]](#)
- 15) E. Demirci, M. Öztürk, R. Topkaya, S. Kazan, N. Akdoğan, M. Obaida and K. Westerholt, Thickness and temperature dependence of exchange bias in Co/CoO bilayers, **J. Supercond. and Novel Magnetism**, **25**, **2591** (2012) [\[DOI\]](#)
- 14) R. Topkaya, R. Yilgin, S. Kazan, N. Akdoğan, M. Obaida, H. İnam and K. Westerholt, Annealing effect on structural and magnetic properties of Cu₂MnAl Heusler alloy films, **J. Supercond. and Novel Magnetism**, **25**, **2605** (2012) [\[DOI\]](#)
- 13) M. Öztürk, E. Demirci, R. Topkaya, S. Kazan, N. Akdoğan, M. Obaida and K. Westerholt, Effect of exchange bias on magnetic anisotropies in Fe/CoO bilayers, **J. Supercond. and Novel Magnetism**, **25**, **2597** (2012) [\[DOI\]](#)
- 12) C. Okay, B. Z. Rameev, S. Güler, R. I. Khaibullin, R. R. Khakimova, Y. N. Osin, N. Akdoğan, A. I. Gumarov, A. Nefedov, H. Zabel and B. Aktaş, Optical and magnetic properties of Ni-implanted and post-annealed ZnO thin films, **Appl. Phys. A** **104**, **667** (2011) [\[DOI\]](#)
- 11) N. Akdoğan, S. Kazan, B. Aktaş, M. Özdemir, H. İnam, M. Obaida, J. Dudek and K. Westerholt, Field cooling-induced magnetic anisotropy in exchange biased CoO/Fe bilayer studied by ferromagnetic resonance, **J. Magn. Magn. Mater.** **323**, **346** (2011) [\[DOI\]](#)

- 10) Y. Köseoğlu, M. Bay, M. Tan, A. Baykal, H. Sözeri, R. Topkaya and N. Akdoğan, Magnetic and dielectric properties of $\text{Mn}_{0.2}\text{Ni}_{0.8}\text{Fe}_2\text{O}_4$ nanoparticles synthesized by PEG-assisted hydrothermal method, **J. Nanopart. Res.** **13**, 2235 (2011) [\[DOI\]](#)
- 9) H. He, K. Zhernenkov, M. Vadalá, N. Akdogan, D. Gorkov, R. Abrudan, B. Toperverg, H. Zabel, H. Kubota and S. Yuasa, The effect of annealing on the junction profile of CoFeB/MgO tunnel junctions, **Journal of Applied Physics** **108**, 063922 (2010) [\[DOI\]](#)
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