

Studies Of Nanoconstrictions, Nanowires And FeO Thin Films

[DOWNLOAD HERE](#)

1;Studies of Nanoconstrictions, Nanowires and Fe₃O₄ Thin Films;3 1.1;Supervisors Foreword;5
1.2;Contents;6 1.3;Acronyms;11 1.4;1 Introduction;14 1.4.1;1.1 Introduction to Nanotechnology;14
1.4.2;1.2 Introduction to Nanoelectronics;16 1.4.2.1;1.2.1 Information Technology: Current Limits;16
1.4.2.2;1.2.2 GMR Heads: Impact on the Information Storage;17 1.4.3;1.3 Comparison of the
Nanostructures Studied in the Thesis from a Dimensional Point of View;20 1.4.4;1.4 Epitaxial Fe₃O₄ Thin
Films;21 1.4.5;1.5 Dual Beam System for the Fabrication of Nanostructures;24 1.4.5.1;1.5.1 Focused
Electron Beam (or SEM);25 1.4.5.2;1.5.2 Focused Ion Beam ;26 1.4.5.3;1.5.3 Focused Electron/Ion
Beam Induced Deposition;26 1.4.6;1.6 Atomic-Sized Nanoconstrictions;29 1.4.6.1;1.6.1 Theoretical
Background for Atomic-Sized Constrictions;29 1.4.6.1.1;1.6.1.1 Introduction;29 1.4.6.1.2;1.6.1.2
Conduction Regimes for Metals;30 1.4.6.1.3;1.6.1.3 Typical Methods for the Fabrication of Atomic
Contacts;31 1.4.6.2;1.6.2 Atomic Constrictions in Magnetic Materials;32 1.4.6.2.1;1.6.2.1 Introduction;32
1.4.6.2.2;1.6.2.2 Ballistic Magnetoresistance;32 1.4.6.2.3;1.6.2.3 Ballistic Anisotropic
Magnetoresistance;33 1.4.7;1.7 Functional Nanowires Created by FEBID/FIBID;34 1.4.7.1;1.7.1 Pt--C
NWs Created by FEBID/FIBID;34 1.4.7.2;1.7.2 Superconducting W-Based NWs Created by FIBID;35
1.4.7.3;1.7.3 Magnetic Co NWs Created by FEBID;36 1.4.8;1.8 Structure of the Thesis;37 1.4.9;1.9
Reproduction of Material;38 1.4.10;References;40 1.5;2 Experimental Techniques;45 1.5.1;2.1
Lithography Techniques;45 1.5.1.1;2.1.1 Optical Lithography;46 1.5.1.2;2.1.2 Dual Beam System;50
1.5.2;2.2 Electrical Measurements;52 1.5.2.1;2.2.1 Magnetotransport Measurements as a Function of
Temperature;52 1.5.2.2;2.2.2 In Situ Electrical Measurements;53 1.5.3;2.3 Spectroscopic Techniques;54
1.5.3.1;2.3.1 Energy Dispersive X-Ray Spectroscopy;54 1.5.3.2;2.3.2 X-Ray Photoelectron
Spectroscopy;55 1.5.4;2.4 Spatially Resolved MOKE Magnetometry;56 1.5.5;2.5 Atomic Force
Microscopy;58 1.5.6;2.6 High Static Magnetic Fields;59 1.5.7;2.7 Other Techniques;59
1.5.8;References;61 1.6;3 Magnetotransport Properties of Epitaxial Fe₃O₄ Thin Films;62 1.6.1;3.1
Introduction;62 1.6.1.1;3.1.1 General Properties of Fe₃O₄;62 1.6.1.2;3.1.2 Properties of Epitaxial Fe₃O₄

Thin Films;64 1.6.2;3.2 Experimental Details;65 1.6.2.1;3.2.1 Growth of the Films;65 1.6.2.2;3.2.2 Types of Electrical Measurement: Van Der Pauw and Optical Lithography;65 1.6.3;3.3 Structural and Magnetic Characterization;65 1.6.4;3.4 Resistivity;68 1.6.4.1;3.4.1 Resistivity as a Function of the Film Thickness (Room Temperature);68 1.6.4.2;3.4.2 Resistivity as a Function of Temperature;68 1.6.5;3.5 Magnetoresistance and Anisotropic Magnetoresistance;69 1.6.5.1;3.5.1 Geometries for MR Measurements;69 1.6.5.2;3.5.2 MR as a Function of Film Thickness (Room Temperature);70 1.6.5.3;3.5.3 MR as a Function of Temperature;72 1.6.6;3.6 Planar Hall Effect;74 1.6.6.1;3.6.1 Introduction to the Planar Hall Effect;74 1.6.6.2;3.6.2 PHE as a Function of Film Thickness (Room Temperature);75 1.6.6.3;3.6.3 PHE as a Function of Temperature;77 1.6.7;3.7 Anomalous Hall Effect;79 1.6.7.1;3.7.1 Introduction to the Anomalous Hall Effect;79 1.6.7.2;3.7.2 AHE as a Function of the Film Thickness (Room Temperature);81 1.6.7.3;3.7.3 AHE as a Function of the Temperature;82 1.6.7.4;3.7.4 AHE in Fe₃O₄: Universal Behavior;83 1.6.7.5;3.7.5 Fe₃O₄ Inside the AHE Dirty Regime of Conductivities;85 1.6.8;3.8 Ordinary Hall Effect;85 1.6.8.1;3.8.1 OHE as a Function of the Film Thickness (Room Temperature);87 1.6.8.2;3.8.2 OHE as a Function of Temperature;88 1.6.9;3.9 Conclusions;89 1.6.10;References;90 1.7;4 Conduction in Atomic-Sized Magnetic Metallic Constrictions Created by FIB;94 1.7.1;4.1 Introduction;94 1.7.2;4.2 Experimental Procedure. Example for a Non-Magnetic Material: Chromium;95 1.7.3;4.3 Iron Nanocontacts;101 1.7.3 EAN/ISBN : 9783642158018 Publisher(s): Springer, Berlin Discussed keywords: Nanotechnologie Format: ePub/PDF Author(s): Fernandez-Pacheco, Amalio

[DOWNLOAD HERE](#)

Similar manuals:

[Nanotechnologies](#)

[The Visioneers: How A Group Of Elite Scientists Pursued Space Colonies, Nanotechnologies, And A Limitless Future - W. Patrick McCray](#)