

Accepted Manuscript

Study of Magnetization Reversal in Layered Heterostructures by Vector Magnetometry

A. Markou, A. Mourkas, A. Koume, I. Panagiotopoulos, L. Stoleriu, A. Stancu

PII: S0304-8853(17)30099-9

DOI: <http://dx.doi.org/10.1016/j.jmmm.2017.08.084>

Reference: MAGMA 63118

To appear in: *Journal of Magnetism and Magnetic Materials*

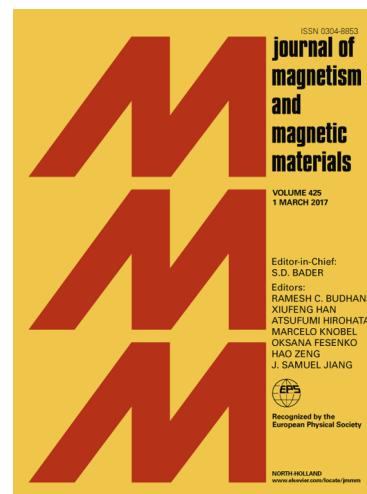
Received Date: 11 January 2017

Revised Date: 15 June 2017

Accepted Date: 29 August 2017

Please cite this article as: A. Markou, A. Mourkas, A. Koume, I. Panagiotopoulos, L. Stoleriu, A. Stancu, Study of Magnetization Reversal in Layered Heterostructures by Vector Magnetometry, *Journal of Magnetism and Magnetic Materials* (2017), doi: <http://dx.doi.org/10.1016/j.jmmm.2017.08.084>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Study of Magnetization Reversal in Layered Heterostructures by Vector Magnetometry

A.Markou^{1,2}, A. Mourkas¹, A. Koume¹, I.Panagiotopoulos¹, L.Stoleriu, A.Stancu³

¹*Department of Materials Science and Engineering,
University of Ioannina, Ioannina 45110, Greece*

²*Current Address: Max Planck Institute for Chemical Physics of Solids,
Nöthnitzer Straße 40, 01187 Dresden, Germany*

³*Department of Physics, Alexandru Ioan Cuza University, 700506 Iasi, Romania*

Abstract

Multilayered films consisting of layer stacks with different anisotropies are studied by vector magnetometry i.e. simultaneous measurement of the components M_x , M_y along and perpendicular to the applied field respectively. The quantity $\sqrt{M_x^2 + M_y^2}$ is used as measure of the homogeneity of the reversal. For the $[\text{Co}(6\text{\AA})/\text{Pt}(15\text{\AA})]_4/(\text{Pt}(s))/[\text{Co}(10\text{\AA})/\text{Pt}(15\text{\AA})]_4$ with $s=0-45\text{\AA}$ series consisting of a perpendicular anisotropy bottom four-bilayer-stack coupled to a planar anisotropy top four-bilayer-stack a peak of the M_y component is clearly observed at the M_x coercivity. This is a sign of homogeneous reversal but it can be shown that similar effects can arise by decoupling of two layers with different (in-plane/perpendicular) anisotropies which is the case for $s>15\text{\AA}$. In order to study the latter effect, a $[\text{Co}(6\text{\AA})/\text{Pt}(15\text{\AA})]_4/\text{W}(15\text{\AA})/\text{Co}(24\text{\AA})$ sample is used as a reference as it consists of a perpendicular anisotropy bottom four-bilayer-stack coupled to a vanishing anisotropy top Co layer through a W layer (which creates a magnetically inactive interface permitting only dipolar coupling). In contrast for $[\text{Co}(5\text{\AA})/\text{Pt}(10\text{\AA})]_6/\text{Pt}(s)/[\text{Ni}(15\text{\AA})/\text{Pt}(5\text{\AA})]_6$ series consisting of two different coercivity stacks which both have perpendicular anisotropy the decoupling does not manifest by appearance of peaks in the M_y component.

Download English Version:

<https://daneshyari.com/en/article/5490530>

Download Persian Version:

<https://daneshyari.com/article/5490530>

[Daneshyari.com](https://daneshyari.com)