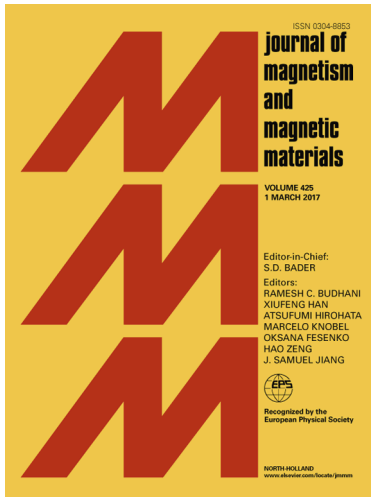

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PII: S0304-8853(17)32617-3
DOI: https://doi.org/10.1016/j.jmmm.2017.10.054
Reference: MAGMA 63268

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

Received Date: 19 August 2017
Revised Date: 4 October 2017
Accepted Date: 13 October 2017

Please cite this article as: C. Wang, L. Zhou, Q. Fu, Y. Tian, S. Wang, H. Gou, J. Ai, L. Zhang, F. Xue, Exchange bias in spin-glass-like $NiFe_2O_4/BiFeO_3$ heterojunction at room temperature, *Journal of Magnetism and Magnetic Materials* (2017), doi: https://doi.org/10.1016/j.jmmm.2017.10.054

Exchange bias in spin-glass-like $NiFe_2O_4/BiFeO_3$ heterojunction at room temperature

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Abstract

In order to improve blocking tepmerature of the exchange bias effects in heterojunction composing of ferromagnetic (FM) materials and multiferroic $BiFeO_3$ (BFO). $NiFe_2O_4$ (NFO) was selected as the FM material to form FM/BFO heterojunction for its high Curie temperature in this paper. NFO/BFO bilayer film was prepared on $Pt/Ti/SiO_2/Si$ substrate via a simple sol-gel spin-coating technique. Exchange bias field at room temperature has been observed as expected and H_{EB}/H_C was 4.5%. The M-T curves of the NFO/BFO heterostructure indicated that the magnetic anisotropy disappeared above 300 K. Furthermore, a field-dependent irreversible magnetization behavior and an exponential decay of coercive field and exchange bias field with temperature were found, which suggested a spin-glass-like state existed in the NFO/BFO heterostructure.

Key words

$NiFe_2O_4/BiFeO_3$ heterojunction, exchange bias, blocking temperature, spin-glass-like state

Introduction

In order to develop novel types of memories and logic devices, multiferroics are