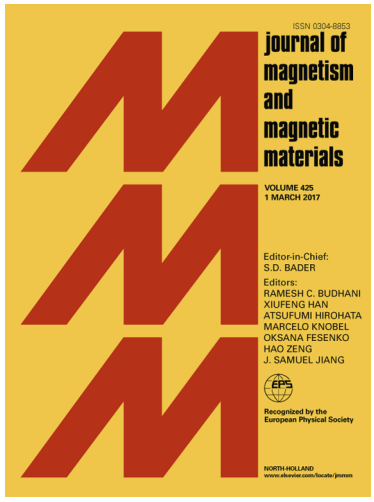

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Lining Pan, Hongkang Xie, Xiaohong Cheng, Chenbo Zhao, Hongmei Feng, Derang Cao, Jianbo Wang, Qingfang Liu

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Tuning the ferromagnetic resonance frequency of soft magnetic film by patterned permalloy micro-stripes with stripe-domain

Lining Pan[1], Hongkang Xie[1], Xiaohong Cheng[1], Chenbo Zhao[1], Hongmei Feng[1], Derang Cao[3], Jianbo Wang[1, 2] and Qingfang Liu[1*]

1 Key Laboratory for Magnetic and Magnetic Materials of the Ministry of Education, Lanzhou University, Lanzhou 730000, People's Republic of China

2 Key Laboratory of Special Function Materials and Structure Design of the Ministry of Education, Lanzhou University, Lanzhou 730000, People's Republic of China

3 College of Physics, Laboratory of Fiber Materials and Modern Textile, the Growing Base for State Key Laboratory, Key Laboratory of Photonics Materials and Technology in Universities of Shandong, and National Demonstration Center for Experimental Applied Physics Education, Qingdao University, Qingdao 266071, China

Abstract

Periodic micro-stripes arrays with stripe domains structures upon continuous permalloy (Py) film were fabricated by sputtering, photolithography and ion beam etching technology. These samples display in-plane magnetic anisotropy, and stripe domains structure is observed by the magnetic force microscopy (MFM) in the area of the micro-stripes. The periodic micro-stripes show an effective impact on static and dynamic magnetic properties of Py continuous film. In the case of dynamic magnetic properties, the resonance frequency f_r of these samples can be tuned by periodic micro-stripes arrays. Compared to continuous film with resonance frequency f_r of 0.64 GHz, the f_r of composite structures can be tuned by the separation gap of periodic micro-stripes arrays from 0.8 GHz to 2.3 GHz at zero-field. At the same time, the f_r could be also tuned by rotating the samples within the plane. This attributes to the competition of shape anisotropy induced by micro-stripes and the dynamic anisotropy originating by stripe domains structure.

Keywords: Periodic micro-stripes arrays, Ferromagnetic resonance frequency, Stripe domain

*Corresponding author.

Qingfang Liu

Lanzhou 730000, People's Republic of China

E-mail address: liuqf@lzu.edu.cn (Q.F. Liu).

Tel.: +86 0931 8914171; Fax: +86 0931 8914160.