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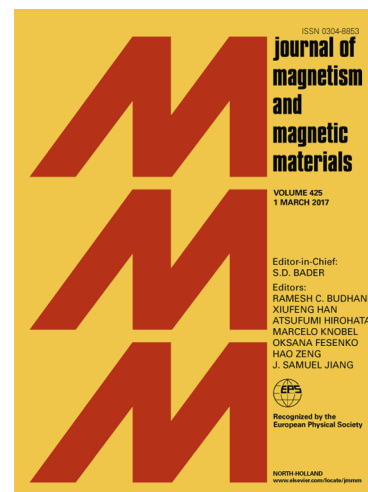
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Tuning the ferromagnetic resonance frequency of soft magnetic film by patterned permalloy micro-strips with stripe-domain

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Abstract

Periodic micro-strips 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-strips. The periodic micro-strips 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-strips 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-strips 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-strips and the dynamic anisotropy originating by stripe domains structure.

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

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