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Ferromagnetic resonance spectroscopy of parametric magnons excited by a four-wave process

Naletov V., De Loubens G., Charbois V., Klein O., Tiberkevich V., Slavin A.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Using a magnetic resonance force microscope, we have performed ferromagnetic resonance spectroscopy of the parametric magnons created by a four-wave process. This is achieved by measuring the differential response to a small amplitude modulation superimposed to a large constant excitation power that drives the dynamics of the uniform mode in the saturation regime. By sweeping the applied field, we observe an abrupt readjustment of the total number of magnons each time the excitation coincides with a parametric mode. This gives rise to ultranarrow peaks whose linewidth is lower than 5×10^{-6} of the applied field. © 2007 The American Physical Society.

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