9.7 cm

SPIN-WAVE RESONANCE IN THE $La_{0.7}Mn_{1.3}O_3$ FILMS.

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Spin-wave resonance (SWR) in high quality epitaxial $La_{0.7}Mn_{1.3}O_3$ films prepared by dc-magnetron sputtering was studied at frequencies of 4 and 9 GHz. SQUID magnetometer was used to study the film magnetization. A well resolved structure of the SWR spectrum consists of surface and bulk spin waves modes with various wave vectors $\mathbf{k}$. A surface anisotropy effect on SWR was investigated. The value of surface anisotropy was changed by an additional annealing of the film in oxygen atmosphere. The main result obtained is the observation of both symmetric and antisymmetric modes owing to the difference of surface anisotropy at the two surfaces of the film. The antisymmetric mode intensities therewith exceed the intensity of the symmetric ones. This situation takes place at low temperatures where magnon interactions are negligible. The experimentally found SWR spectra are in good agreement with the theory of SWR based on the surface-inhomogeneity models. Using the SWR and magnetization data, the spin-wave stiffness constant, the values of bulk and surface anisotropies and exchange interaction parameters were estimated. This work was partly supported within European Community program ICA1-CT-2000-70018 (Centre of Excellence CELDIS), Polish Grant No. 2 PO3B 139 18, Russian Foundation for Basic Research Grant No. 01-02-17479 and DFG, Sfb 290.

13.4 cm

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