

Supplementary materials

FMR spectra measured in 10 nm YIG layer grown at 1000°C for in-plane (a) and out-of-plane (b) orientation of magnetic field are present in Fig. 1SM.

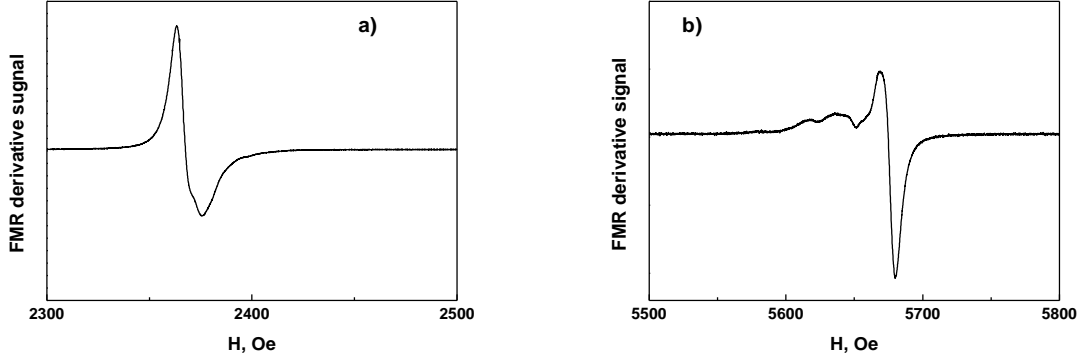


FIG. 1SM Typical FMR spectra of 10 nm YIG layer grown at 1000°C for in-plane (a) and out-of-plane (b) orientation of magnetic field.

The effective magnetization $4\pi M_s - H_a$ in films was calculated from FMR spectra using the values of resonance magnetic fields in the in-plane (H_{in}) and perpendicular (H_{out}) orientations [5].

$$F_{\parallel} = \gamma \left[H_{in} (H_{in} + 4\pi M_s - H_a) \right]^{1/2}, \quad (1)$$

$$F_{\perp} = \gamma \left[H_{out} - (4\pi M_s - H_a) \right]. \quad (2)$$

Here g is the gyromagnetic ratio; F_{\parallel} and F_{\perp} are resonance frequencies for the in-plane and perpendicular magnetizations, respectively. The $4\pi M_s - H_a$ and γ value is found by solving the equations (1), (2) with respect to variables γ and $4\pi M_s - H_a$ and is presented in Table II. The line width ΔH is determined as the distance between the extrema of FMR signals. The line widths ΔH_{\perp} and ΔH_{\parallel} for the perpendicular and in-plane orientations of the magnetic field are also shown in Table II.

Table Number of structure, loop coercivity and in-plane anisotropy field, in-plane resonance field H_{in} , out-of-plane resonance field H_{out} , FMR line width ΔH_{in} and ΔH_{out} , calculated gyro-magnetic ratio γ , effective magnetic field H_{eff} .

Sample	H _C (Oe)	H _a (Oe)	H _{in} (Oe)	Δ H _{in} (Oe)	H _{out} (Oe)	Δ H _{out} (Oe)	γ (MHz/Oe)	H _{eff} (Oe)
8035	0.23	-1.3	2391	13	5601	14	2.82	2265
8037	0.4	-2.0	2510	12	5218	19	2.83	1897
8040	0.7	-2.7	2387	17	5607	25	2.82	2274
8043	0.8	~-2	2348	16	5769	22	2.81	2422
8044	0.35	-2.0	2367	11	5674	11	2.83	2350