Supplemental Document

Optics Letters

Multidetection scheme for transient-grating-based spectroscopy: supplement

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Supplement DOI: https://doi.org/10.6084/m9.figshare.21528615

Parent Article DOI: https://doi.org/10.1364/OL.476958

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DETAILS ON SAMPLE GROWTH AND MAGNETIC CHARACTERIZATION

The sample is a 40 nm thick polycrystalline Ni film deposited on 1 mm double polished Ted Pella fused quartz substrate, and capped with a 10 nm thick SiO_2 film to prevent Ni oxidation. It is fabricated at the Facility of Nano Fabrication (FNF) of IOM-CNR by electron-beam vapor deposition [1]. The thicknesses reported are deduced from previous calibration of the deposition facility. Alfa Aesar 99.995% pure rods and powder are used for the deposition of the Ni thin film and the SiO_2 capping, respectively. The electron beam energy is set to be approximately 10 keV. The deposition parameters are shown in Table S1.

We performed longitudinal Magneto-Optical Kerr Effect (MOKE) measurements at the NFFA facility in connection with the APE-HE beamline of IOM at Elettra Synchrotron [2] to probe the in-plane magnetic anisotropy of the sample. We used a 658 nm continuous-wave low-power WorldStarTech TECBL-10GC laser source. The incident angle was set to be 45° with respect to the normal to the sample surface and the intensity on sample was set to ~ 8 mWcm^{-2}. Figure S1 shows the hysteresis loops of the sample azimuthally rotated by different angles with respect to an arbitrary sample edge. As expected for a polycrystalline magnetic thin film, the hysteresis loops are squared and present a remanence close to the magnetization at saturation, meaning an easy-plane magnetic anisotropy. However, since the in-plane rotation of the sample does not significantly affect the hysteresis loop, there is no overall in-plane magnetic anisotropy. From hysteresis loops, it is possible to extract coercive field $H_c \simeq 2$ mT and saturation magnetic field $H_s \simeq 5$ mT. Hence, the measurements reported in the main text are in magnetic saturation.

Table S1. Electron gun vapor deposition pressure (P), temperature (T) and evaporation rate (E.R.) of Ni and SiO_2 capping.

	P (torr)	T (K)	E.R. (Å/s)
Ni	$9 \cdot 10^{-7}$	300	0.1
SiO_2	$1.3 \cdot 10^{-6}$	300	0.3

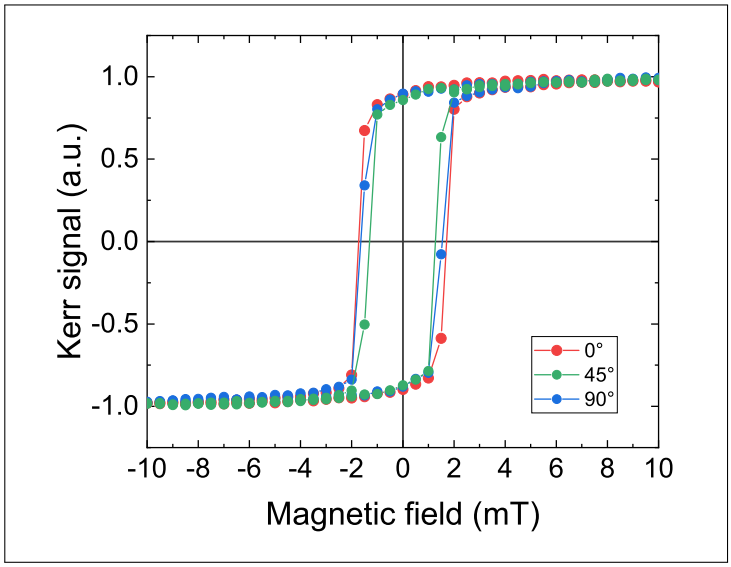

Fig. S1. Hysteresis loops of the sample at different angles with respect to the reference direction (0°) arbitrarily chosen as parallel to one of the sample edges.

REFERENCES

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