MSSW nonreciprocity and focusing in YIG/ferromagnetic metal structure

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It is well known that magnetostatic surface wave (MSSW) spectrum in magnetic bilayers is nonreciprocal. MSSW propagation and its spectrum were studied primarily for YIG films based structures with the magnetization $4\pi M$ of films in the range 400 $\leq 4\pi M_{1,2} \leq$ 1750 G. In this work, we discuss MSSW propagation and its focusing by curved antennas in layered structure YIG/ferromagnetic metal (Co, Fe) that have the difference of layers' magnetization $4\pi\Delta M \gg$ 1750 G and, thus, potentially very strong nonresiprocity of MSSW dispersion. We experimentally demonstrate strong nonreciprocity of MSSW propagation in YIG/Co structure. The results of micromagnetic simulation of MSSW excitation by curved antenna and focusing effects in YIG/ferromagnetic metal structure were also discussed.

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