

Spin waves interference under excitation by focusing transducers: logic and signal processing

© M. Madami¹, G. Gubbiotti², Y.V. Khivintsev^{3,4}, G.M. Dudko³, V.K. Sakharov³, A.V. Kozhevnikov³, Y.A. Filimonov^{3,4,5}, A.G. Khitun⁶

¹ Dipartimento di Fisica e Geologia, Università di Perugia, via A. Pascoli, I-06123 Perugia, Italy

² Istituto Officina dei Materiali del CNR (CNR-IOM), sede secondaria di Perugia, c/o Dipartimento di Fisica e Geologia, Università di Perugia, I-06123 Perugia, Italy

³ Kotelnikov Institute of Radioengineering and Electronics, Saratov Branch, 410005 Saratov, Russia

⁴ Chernyshevsky Saratov State University, 410012 Saratov, Russia

⁵ Yuri Gagarin State Technical University of Saratov, 410054 Saratov, Russia

⁶ University of California-Riverside, Riverside, California, USA 92521

E-mail: yuri.a.filimonov@gmail.com, khivintsev@gmail.com, valentin@sakharov.info, marco.madami@unipg.it, gubbiotti@iom.cnr.it, akhitun@ece.ucr.edu, dugal_2010@hotmail.com, kzhavl@gmail.com

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Micro-focused Brillouin-Mandelstam light scattering technique and micromagnetic simulations were used to study surface (SSW) and backward volume (BVSW) spin waves (SW) interference under excitation by curvilinear focusing transducers placed oppositely to each other on a top of tangentially magnetized yttrium iron garnet (YIG) film. It is shown that due to anisotropic propagation, the 2D interference patterns for both SSW and BVSW focused beams are nonreciprocal. Due to chromatic aberration and caustics formation of the focusing transducers, the interference pattern of the focused SW beams depends on excitation frequency and is sensitive to local nonuniformities in YIG film. The obtained results demonstrate the possibility to use curvilinear SW focusing transducers for information technologies based on magnonic optics.

Keywords: spin waves interference, spin waves focusing transducer, logic and signal processing.

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