

Abstract Submitted
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Low-energy information transfer between dipolar-coupled magnetic disks observed by time resolved magnetic soft X-ray microscopy¹
PETER FISCHER, CXRO/LBNL, HYUNSUNG JUNG, KI-SUK LEE, DAE-EUN JEONG, YOUNG-SEOK CHOI, YOUNG-SANG YU, DONG-SOO HAN, Dept MSE/Seoul Natl U, ANDREAS VOGEL, LARS BOCKLAGE, GUIDO MEIER, IAP/U Hamburg, MI-YOUNG IM, CXRO/LBNL, SANG-KOOG KIM, Dept MSE/Seoul Natl U — The coupling between oscillators allows to mutually transfer energy and also to propagate information signals. Utilizing the concept of coupled oscillators, we experimentally demonstrated a new mechanism for energy transfer between spatially separated dipolar-coupled magnetic disks by stimulated vortex gyration. Direct experimental evidence was obtained by state-of-the-art experimental time-resolved soft X-ray microscopy probe. The rate of energy transfer from one disk to the other was derived from the two normal modes' frequency splitting caused by dipolar interaction. This mechanism provides tunable energy transfer rates, low-power input signals and negligible energy loss in the case of negligible intrinsic damping. Coupled vortex-state disks might find applications in future information-signal processing. H. Jung, et al., NPG - Scientific Reports 1 59 (2011); M.-W. Yoo, et al., Phys. Rev. B 82, 174437 (2010); H. Jung, et al., Appl. Phys. Lett. 97, 222502 (2010); Y.-S. Choi, et al., Phys. Rev. B 80, 012402 (2009); P. Fischer, et al., Phys Rev B 83 212402 (2011).

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