Abstract Submitted
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Experimental manipulation of magnetic states of magnetostrictive nanomagnets using surface acoustic waves[1] VIMAL SAMPATH, DHRITIMAN BHATTACHARYA, NOEL D'SOUZA, SUPRIYO BANDYOPADHYAY, JAYASIMHA ATULASIMHA, Virginia Commonwealth University — The use of Surface Acoustic Waves (SAW) to assist magnetization switching in magnetostrictive nanomagnets has been theoretically studied [1] and SAW-induced magnetization rotation in micron size magnets has been experimentally demonstrated [2]. We report recent experiments on manipulation of magnetic states of Co nanoscale magnets shaped like elliptical disks (˜300 nm major axis, 240 nm minor axis and 10 nm thickness) delineated on bulk 128 Y-cut lithium niobate using SAW. Specifically, isolated nanomagnets that are initially in single domain states with magnetization pointing along the major axis of the ellipse are driven into a vortex state by SAW waves. However, SAW waves can trigger complete magnetization reversal in nanomagnets of moderate shape anisotropy that are dipole coupled to a highly shape anisotropic neighboring nanomagnet. [1] A.K. Biswas, S. Bandyopadhyay & J. Atulasimha, Appl. Phys. Lett., 105, 072408 (2014). [2] S. Davis, A. Baruth & S. Adenwalla, App. Phys. Lett., 97, 232507 (2010).The authors acknowledge the use of high voltage and high frequency pulse generator from Prof. Umit Ozgur's lab and the help of Prof. Gary Atkinson in fabrication of the IDTs for generating the SAW.

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