Abstract Submitted
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Non-local thermal spin injection to study spin diffusion in yttrium iron garnet[1] BRANDON GILES, Dept. of Materials Science and Engineering, The Ohio State University, ZIHAO YANG, JOHN JAMISON, Dept. of Electrical and Computer Engineering, The Ohio State University, ROBERTO MYERS, Dept. of Materials Science and Engineering, The Ohio State University — Understanding the generation, detection, and manipulation of spin current is critical for the development of devices that depend on spin transport for information processing and storage. Recent studies have shown that spin transport over long distances is possible in the magnetic insulator yttrium iron garnet (YIG) through the diffusion of non-equilibrium magnons. Electrically excited magnons have been shown to diffuse up to 40um at room temperature [1], while thermally injected magnons were detected at ranges greater than 125um at 23K [2]. However, much work is still required to fully understand the processes responsible for magnon diffusion. Here, we present an in-depth study of the diffusion of magnons in YIG. By using the non-local thermal spin detection method [2], we analyze spin transport as a function of temperature. Spin diffusion maps, which can be used to experimentally determine the spin diffusion length in YIG as a function of temperature, are presented. [1] L. J. Cornelissen, *et al.* Nat Phys (2015). [2] B. L. Giles, *et al.* arXiv:1504.02808 [cond-Mat] (2015).

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Brandon Giles
Dept. of Materials Science and Engineering, The Ohio State University

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