Abstract Submitted
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High-frequency effects in antiferromagnetic $Sr_3Ir_2O_7$ MORGAN WILLIAMSON, HEIDI SEINIGE, SHIDA SHEN, CHENG WANG, The University of Texas at Austin, GANG CAO, University of Colorado-Boulder, JIANSHI ZHOU, JOHN GOODENOUGH, MAXIM TSOI, The University of Texas at Austin — Antiferromagnetic (AFM) spintronics is one of many promising routes for 'beyond the CMOS' technologies where unique properties of AFM materials are exploited to achieve new and improved functionalities. AFMs are especially interesting for high-speed memory applications thanks to their high natural frequencies. Here we report the effects of high-frequency (microwave) currents on transport properties of antiferromagnetic Mott insulator $Sr_3Ir_2O_7$. The microwaves at 3-7 GHz were found to affect the material's current-voltage characteristic and produce resonance-like features that we tentatively associate with the dissipationless magnonics recently predicted to occur in antiferromagnetic insulators subject to ac electric fields [1]. Our observations support the potential of antiferromagnetic materials for high-speed/high-frequency spintronic applications. This work was supported in part by C-SPIN, one of six centers of STARnet, a Semiconductor Research Corporation program, sponsored by MARCO and DARPA, by NSF grants DMR-1207577, DMR-1265162, DMR-1600057, and DMR-1122603, and by the King Abdullah University of Science and Technology (KAUST) Office of Sponsored Research (OSR) under Award No. OSR-2015-CRG4-2626. [1] W. Chen and M. Sigrist, Phys. Rev. Lett. 114, 157203 (2015).

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