Abstract Submitted
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Controlling the Phase of Ferromagnetic Josephson Junctions for Cryogenic Memory Applications[1] BETHANY NIEDZIELSKI, Michigan State University, ERIC GINGRICH, Northrop Grumman Systems Corporation, JOSEPH GLICK, Michigan State University, YIXING WANG, Seagate Technology, DON MILLER, Northrop Grumman Systems Corporation, REZA LOLOEE, WILLIAM PRATT JR., NORMAN BIRGE, Michigan State University — Josephson junctions containing ferromagnetic layers are currently of interest for use in cryogenic memory where either the phase or critical current can be switched between two distinct states. We present the first direct phase measurements of such a junction demonstrating control of the phase [1]. If a junction contains one ferromagnetic layer, the thickness of that layer dictates the ground state phase between the superconducting electrodes, which can be either 0 or π. If the junction contains two ferromagnetic layers and the layer thicknesses are carefully chosen, then the phase of a single junction can be switched between 0 and π by changing the relative magnetization directions of the two layers from antiparallel to parallel. We have successfully fabricated and directly measured the relative phase of two such spin valve junctions in a SQUID loop to confirm the phase change from π to 0 and back again of each junction. We report our continued progress in optimizing the control of such systems. [1] E. C. Gingrich, B. M. Niedzielski, J. A. Glick, Y. Wang, D. L. Miller, R. Loloee. W. P. Pratt Jr., and N. O. Birge, arXiv:1509.05368

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