

Abstract Submitted
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New apparatus for the measurement of the electron and positron g -factors to test the Standard Model¹ BENEDICT SUKRA, Center for Fundamental Physics, Northwestern University, XING FAN, Department of Physics, Harvard University; Center for Fundamental Physics, Northwestern University, SAMUEL FAYER, THOMAS MYERS, GERALD GABRIELSE, Center for Fundamental Physics, Northwestern University — The comparison of the measurement of the electron magnetic moment with its predicted value from the Standard Model yields the most precise test of the Standard Model [1, 2]. This 0.9 parts per trillion comparison between measurement and theory reveals a 2.4σ discrepancy which warrants further investigation [3, 4]. Additionally, a comparison between the electron and positron magnetic moments provides a strong test of CPT symmetry. An apparatus currently being constructed has the goal of improving on the previous measurement of the electron and positron g -factors. A Penning trap has been designed with careful consideration of the microwave cavity mode structure with the aim of cooling the axial state via cavity-assisted sideband cooling. The apparatus includes a low field region about 40 cm from the electron trap for implementation of a SQUID detector. A proposed measurement procedure will be presented. 1. D. Hanneke, S. Fogwell, and G. Gabrielse, *Physical Review Letters* 100 (2008) 120801 2. R. H. Parker, C. Yu, W. Zhong, B. Estey, and H. Müller, *Science* 360 (2018) 191 3. G. Gabrielse, S.E. Fayer, T.G. Myers, X. Fan, *Atoms* 2019, 7, 45. 4. T. Aoyama, T. Kinoshita, M. Nio, *Atoms* 2019, 7, 28.

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