

Abstract Submitted  
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**Towards an improved electron and positron magnetic moment measurement as a test of the standard model and CPT symmetry<sup>1</sup>**

SAMUEL FAYER, Northwestern University and Harvard University, THOMAS MYERS, Northwestern University, XING FAN, Harvard University, GERALD GABRIELSE, Northwestern University and Harvard University — An improved apparatus and a new measurement strategy will allow for significant increase in the precision of the electron magnetic moment measurement to below 0.28 ppt. The electron magnetic moment is the most precise test of the standard model <sup>2</sup> and, when combined with calculations, results in the most precise determination of the fine structure constant. Recent progress in theoretical calculations <sup>3</sup>, which reduced the uncertainty in the QED corrections gives a basis for an improved measurement to test the standard model. The g-factor of positrons and electrons will be measured using quantum jump spectroscopy between the lowest energy states within a 100 mK cylindrical Penning trap. A direct comparison of the electron and positron magnetic moment gives the most precise test of CPT symmetry for the light leptons. This apparatus will allow for a measurement for the positron that is equally as precise as the electron, improving it by a factor of more than 15. Details of the developed measurement apparatus and recent progress towards the improved measurements for both the positron and electron will be presented.

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<sup>2</sup>D. Hanneke, S. Fogwell, and G. Gabrielse, PRL 100 (2008) 120801

<sup>3</sup>S. Laporta, PLB, 772 (2017) 232

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